EDF Energy Nuclear Generation Ltd

Decommissioning of Hunterston B Nuclear Power Station

Environmental Statement

Volume III: Appendices

December 2023

Public

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Report for

EDF Energy Nuclear Generation Limited (EDF)

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Management systems

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Introduction

Appendix 1A: Competent Experts and Competency Statement

Appendix 1A Competent Experts and Competency Statement

1A.1.1 As required under Regulation 5 (2) of the EIADR Regulations, an Environmental Statement ("ES") must be prepared by competent experts with the relevant expertise and qualifications.

1A.1.2 WSP is registered with the Institute of Environmental Management and Assessment (IEMA)'s Environmental Impact Assessment (EIA) Quality Mark scheme. The scheme allows organisations that lead the co-ordination of EIAs in the UK to make a commitment to excellence in their EIA activities and have this commitment independently reviewed.

1A.1.3 The Applicant confirms that the competent experts engaged in the delivery of this ES are appropriate and Suitable Qualified Experienced Professionals (SQEP).

1A.1.4 Competent experts involved in the preparation of this Environmental Statement are listed in **Table 1A.1**. The second column of this table includes two categories of staff, with different levels of responsibility:

- Primary author
- Secondary author

Table 1A.1 List of competent experts

Topic	Responsibility	Name of company	Qualifications / competencies of author
Project Director	Lead Verifier	WSP	BSc (Hons) in Environmental Sciences, MSc (with Distinction) in Environmental Assessment. Over 34 years in environmental consulting and Nuclear Sector EIA Lead from 2009. Full Member of Institute of Environmental Sciences (IES).
Introduction	Primary Author	WSP	PhD in Environmental Geochemistry and Geomicrobiology, MEarth Sciences (Hons) in Earth Sciences, CEnv, Member of Institution of Environmental Sciences (IES), Pracitioner Member of IEMA, 7 years' experience in EIA
Introduction	Secondary Author	WSP	BSc (Hons) in Marine Biology, MSc in Sustainability and Consultancy, GIEMA, 2 years' experience in EIA.
Policy and Legislation	Primary Author	WSP	BSc (Hons) in Town and Country Planning, Chartered Town Planner, 20 years' experience in Waste Management Consultancy.
The Decommissioning Process	Primary Author	EDF Nuclear Generation Limited	MSc in Environmental Science, BSc in Environmental Science, PIEMA, 8 years' experience in EIA.

Topic	Responsibility	Name of company	Qualifications / competencies of author
Alternatives	Primary Author	EDF Nuclear Generation Limited	MSc in Environmental Science, BSc in Environmental Science, PIEMA, 8 years' experience in EIA.
The Environmental Impact Assessment Process	Primary Author	WSP	BSc (Hons) in Marine Biology, MSc in Sustainability and Consultancy, GIEMA, 2 years' experience in EIA.
Air Quality	Primary Author	WSP	BSc (Hons) in Biology, MSc in Environmental Diagnostics, Full member of IAQM, Full member of IES, 16 years' experience in Air Quality Consultancy.
Air Quality	Secondary Author	WSP	BSc (Hons) in Chemistry, MSc in Climate Change and Environmental Policy, Member of IES and IAQM, 4 years' experience in Air Quality Consultancy.
Climate Change	Primary Author	WSP	BSc (Hons) in Biology, MSc in Environmental Diagnostics, Full member of IAQM, Full member of IES, 16 years' experience in Air Quality Consultancy.
Climate Change	Secondary Author	WSP	BSc (Hons) in Economics, MSc in Sustainable Development, 2 years' experience in Environmental Consultancy.
Terrestrial Biodiversity and Ornithology	Primary Author	WSP	BSc (Hons) in Ecology, MRes in Ecology, Chartered Environmentalist with the Society for the Environment, Member of CIEEM, over 20 years' experience of Ecology Consultancy.
Terrestrial Biodiversity and Ornithology	Secondary Author	WSP	BSc (Hons) in Zoology, MSc in Marine Environmental Protection, over 10 years' experience of Ecology Consultancy.
Marine Biodiversity	Primary Author	WSP	BSc. Marine and Freshwater Biology. MSc Aquatic Resource Management. PhD Biological Science (Marine Ecology). Over 30 years' experience in Marine & Coastal EIA and ESHIA.
Marine Biodiversity	Secondary Author	WSP	BSc (Hons) in Marine and Freshwater Biology, MSc in Estuarine and Coastal Science and Management, Full Member of CIEEM, 16 years' experience in Marine Consultancy.
Coastal Management and Water Quality	Primary Author	WSP	BSc (Hons) in Chemistry, MSc in Ecology, Fellow of the CIWEM, Fellow of the Royal Society of Biology, 49 years' experience in Water Quality Consultancy.

Topic	Responsibility	Name of company	Qualifications / competencies of author
Coastal Management and Water Quality	Secondary Author	WSP	BSc (Hons) in Marine and Freshwater Biology, MSc in Estuarine and Coastal Science and Management, Full Member of CIEEM, 16 years' experience in Marine Consultancy.
Surface Water and Flood Risk	Primary Author	WSP	BSc (Hons) in Geography, MSc in Water Resource System Engineering, PhD in Analysis of Spatial variability in Snow Processes, Chartered Scientist with the Science Council, Member of CIWEM, 16 years' experience in Water Consultancy.
Surface Water and Flood Risk	Secondary Author	WSP	BSc (Hons) in Geography, MSc in Hydrology and Climate Change, Member of CIWEM, 11 years' experience in Water Consultancy.
Soils, Geology and Hydrogeology	Primary Author	WSP	BSc (Hons) in Plant Sciences, MSc in Environmental Rehabilitation, Professional Certificate in Management, PIEMA, Environmental auditor for IEMA, over 20 years' experience in Environmental Consultancy.
Soils, Geology and Hydrogeology	Secondary Author	WSP	MEnvS in Environmental Studies, PIEMA, 15 years' experience in Environmental Consultancy.
Historic Environment	Primary Author	WSP	BA (Hons) in Archaeology and Prehistory, Member of CIfA, 33 years experience in Historic Environment sector.
Historic Environment	Secondary Author	WSP	BA in Ancient History and Archaeology, MA in Landscape Archaeology, Practitioner member of CIfA, 9 years' experience in Historic Environmental Consultancy.
LVIA	Primary Author	WSP	BA (Hons) in Landscape Architecture, Postgraduate Diploma in Landscape Architecture, Chartered Member of Landscape Institute, 18 years' experience in LVIA Consultancy.
LVIA	Secondary Author	WSP	Master of Landscape Architecture (MLA), MSc Environmental Resource Management, Chartered Member of Landscape Institute, 17 years' experience in LVIA Consultancy
Noise and Vibration	Primary Author	WSP	BSc (Hons) in Acoustics, HND in Sound Engineering & Multimedia Integration, Corporate member of

Topic	Responsibility	Name of company	Qualifications / competencies of author
			IOA, 10 years' experience in Acoustics Consultancy.
Noise and Vibration	Secondary Author	WSP	BSc in Chemistry, MSc in Environmental Acoustics, Diploma in Acoustics and Noise Control, Professional member of IOA, 5 years' experience in Local Authority Pollution Control, 16 years in Acoustics Consultancy
Traffic and Transport	Primary Author	WSP	BA (Hons) Town Planning, DipTP Town Planning, Eng Civil Engineering, MSc in Transport Engineering and Operations, Chartered Member of Royal Town Planning Institute, 29 years' experience in Transport Planning.
Traffic and Transport	Secondary Author	WSP	Master of Technology (M.Tech.) in Transportation Engineering, Bachelor of Technology (B.Tech.) in Civil Engineering, 7+ years' experience in Transport Planning and Economics.
Socio-economics	Primary Author	WSP	BA in Engineering, MA in Engineering, over 25 years' experience in Socio-economic Consultancy.
Major Accidents and Disasters	Primary Author	WSP	MChem BSc (Hons) in Chemistry, Member of RSC, Registered Scientist with The Science Council, Chartered Environmentalist (CEnv), Chartered Chemist (CChem), 10 years' experience working with Major Hazards.
Conventional Waste	Primary Author	WSP	BSc (Hons) in Town and Country Planning, Chartered Town Planner, 20 years' experience in Waste Management Consultancy.
Conventional Waste	Secondary Author	WSP	BSc (Hons) in Environmental Studies, PgDip Environmental Rehabilitation Member of Chartered Institution of Wastes Management, over 27 years' experience in the waste management industry and consultancy.
Radioactive Waste and Discharges	Primary Author	WSP	BSc (Hons) in Environmental Sciences, MSc (with Distinction) in Environmental Assessment. Over 34 years in environmental consulting and Nuclear Sector EIA Lead from 2009. Full Member of Institute of Environmental Sciences (IES).

Appendix 1B: Glossary and Abbreviations

Appendix 1B
Glossary of terms and abbreviations

Abbreviations

Term/abbreviation	Definition
AA	Annual Average
AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekday Traffic
ACD	Admiralty Chart Datum
AEDL	Active Effluent Discharge Line
AEP	Annual Exceedance Probability
AETP	Active Effluent Treatment Plant
AGL	Above ground level
AGR	Advanced Gas Cooled Reactor
ALARP	As low as reasonably practicable
AOD	Above Ordnance datum
AON	Apparently Occupied Nest
APC	Area of Potential Concern
APIS	Air Pollution Information System
AQAL	Air Quality Assessment Level
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Standard
ATC	Automatic Traffic Count
AWI	Ancient Woodland Inventory
BAP	UK Biodiversity Action Plan

Term/abbreviation	Definition
BAT	Best available techniques
BDP16	Baseline Decommissioning Plan 2016
BEIS	Department for Business, Energy and Industrial Strategy
BGS	British Geological Society
BNFL	British Nuclear Fuels Limited
BNG	Biodiversity Net Gain
BNL	Basic Noise Level
BoCC	Birds of Conservation Concern
BPM	Best Practicable Means
BTO	British Trust for Ornithology
CAFS2	Cleaner Air for Scotland 2
CAR	Water Environment (Controlled Activity) (Scotland) Regulations 2011
CBC	Common Bird Census
CCA	Coastal Character Area
CCC	Climate Change Committee
CCR	Climate Change Resilience
CDG19	The Carriage of Dangerous Goods (Amendment) Regulations 2019
CDM	Construction Design and Management
CDOIF	Chemical and Downstream Oil Industries Forum
CEA	Cumulative Effects Assessment
CEH	Centre of Ecology and Hydrology
CH_4	Methane
CIBSE	Chartered Institution of Building Services Engineers
CIEEM	Chartered Institute of Ecology and Environmental Management

Term/abbreviation	Definition
CL	Critical Level
CLVIA	Cumulative Landscape and Visual Impact Assessment
CMPP	Clyde Marine Planning Partnership
CO	Carbon Monoxide
COMAH	Control of Major Accident Hazards
CoP	Code of practice
COPA	Control of Pollution Act
COSHH	The Control of Substances Hazardous to Health Regulations 2002
CR	Critically endangered
CRTN	Calculation of Road Traffic Noise
CSZ	Core Sustenance Zones
CW	Cooling Water
C_6H_6	Benzene
DEPZ	Detailed Emergency Planning Zone
DETR	Department for the Environment, Transport and Regions
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DoWCoP	Definition of Waste Code of Practice
DSEAR	The Dangerous Substances and Explosive Atmospheres Regulations 2002
DWPF	Decommissioning Waste Processing Facility
DWMC	Decommissioning Waste Management Centre
DTM	Digital Terrain Model
EASR 18	Environmental Authorisations (Scotland) Regulations 2018
EC	European Commission

Term/abbreviation	Definition
EcIA	Ecological Impact Assessment
EEA	European Economic Area
EFT	Emission Factor Toolkit
ENGL	EDF Nuclear Generation Limited
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
EIADR	Environmental Impact Assessment for Decommissioning Regulations
ELC	European Landscape Convention
eMARS	European Commission Major Accident Reporting System
EMP	Environment Management Plan
EPA	Environmental Protection Act
EPS	European Protected Species
EQS	Environmental Quality Standard
ES	Environmental Statement
ESS	Early Safestore Strategy
ESCCS	Environmental Sustainability & Climate Change Strategy
ETS	Emissions Trading Scheme
EU	European Union
FEH	Flood Estimation Handbook
FoV	Field of View
FRA	Flood Risk Assessment
FSC	Final Site Clearance
FTE	Full Time Equivalent
GBq/te	Gigabecquerels per tonne
GDF	Geological Disposal Facility

Term/abbreviation	Definition
GEART	Guidelines for the Environmental Assessment of Road Traffic
GES	Good Environmental Status
GHG	Greenhouse Gases
GLVIA3	Third edition of the Guidelines for Landscape and Visual Impact Assessment
GPP	Guidance for Pollution Prevention
GPS	Global Positioning System
HADV	Higher Activity Debris Vault
HASWA	Health & Safety at Work etc Act 1974
HAW	Higher Activity Waste
HDV	Heavy Duty Vehicle
HEP	Historic Environment Policy
HEPS	Historic Environment Policy for Scotland
HER	Historic Environmental Records
HES	Historic Environment Scotland
HFC	Hydrofluorocarbon
HGV	Heavy Goods Vehicle
HLW	High Level Waste
HNA	Hunterston A Nuclear Power Station
HNB	Hunterston B Nuclear Power Station
HRA	Habitats Regulations Assessment
HSAW	Health and Safety at Work
HSC	Hazardous Substances Consent
HSDA	Hunterston Strategic Development Area
HSE	Health and Safety Executive
Hunterston PARC	Hunterston Port and Resource Campus

Term/abbreviation	Definition
HVDC	High Voltage Direct Current
IAQM	Institute of Air Quality Management
ICE	Inventory of Carbon and Energy
ICCI	In-combination Climate Change Impact
ICILWS	Interim Conditioned Intermediate Level Waste Store
IEA	Institute of Environmental Assessment
IEEM	Institute of Ecology and Environmental Management
IEMA	Institute of Environmental Management and Assessment
ILMP	Integrated Land Management Plan
ILW	Intermediate Level Waste
INNS	Invasive and Non-Native Species
IPCC	Intergovernmental Panel on Climate Change
IRR	Ionising Radiations Regulations
IWS	Integrated waste strategy
KPI	Key Performance Indicator
LAQM	Local Air Quality Management
LBAP	Local Biodiversity Action Plan
LCRM	Land Contamination Risk Management
LCT	Landscape Character Type
LDP	Local Development Plan
LDV	Light Duty Vehicle
LLW	Low Level Waste
LMAR	Land Management Annual Review
LNCS	Local Nature Conservation Sites
LOAEL	Lowest Observed Adverse Effect Level
LoC	Letter of Compliance

Term/abbreviation	Definition
LOLER	Lifting Operations and Lifting Equipment Regulations 1998
LPD	Local Plan District
LQM	Land Quality Management
LSE	Likely Significant Effects
LT	Long-term
LVIA	Landscape and Visual Impact Assessment
LWS	Listed Wildlife Site
MAC	Maximum allowable concentration
MACR	Major Accident Control Regulation
MAHP	Major Accident Hazard Pipeline
MAPP	Major Accident Prevention Policy
MHWS	Mean High Water Springs
MHSAW	The Management of Health and Safety at Work Regulations 1999
MNCR	Marine Nature Conservation Review
MPA	Marine Protected Area
MSFD	Marine Strategy Framework Directive
MD-LOT	Marine Directorate Licensing Operations Team
mSv	Millisieverts
MtCO2e	Mega tonnes carbon dioxide equivalent
NAC	North Ayrshire Council
NCR	National Cycle Route
NDA	Nuclear Decommissioning Authority
NDC	Nationally Determined Contribution
NERC	Natural Environment Research Council
NGR	National Grid Reference

Term/abbreviation	Definition
NHS	National Health Service
NIA	Nuclear Installations Act
NLF	Nuclear Liabilities Fund
NNR	National Nature Reserve
NO_x	Oxides of Nitrogen
NO_2	Nitrogen Dioxide
NPF	National Planning Framework
NRMM	Non-Road Mobile Machinery
NRW	Natural Resources Wales
NSA	National Scenic Area
NSL	Nuclear Site Licence
NSR	Noise Sensitive Receptor
NSR	Non-Statutory Register
NT	Near Threatened
NTEM	National Trip End Model
N_2O	Nitrous Oxide
OEPZ	Outer Emergency Planning Zone
ONR	Office for Nuclear Regulation
ONS	Office of National Statistics
OS	Ordnance Survey
OWPF	Operational Waste Processing Facility
PAD	Protocol for Archaeological Discovery
PAH	Polycyclic aromatic hydrocarbons
PAN	Planning Advice Note
Pb	Lead
PC	Process Contribution

Term/abbreviation	Definition
PFC	Perfluorocarbon
PfQ	Preparations for Quiescence
PIA	Personal injury accident
PIRP	Pollution Incident Response Plan
PMF	Priority Marine Feature
$PM_{2.5}$	Particulate Matter smaller than 2.5µm
PM_{10}	Particulate Matter smaller than 10µm
PPC	Pollution Prevention and Control
PPE	Personal Protective Equipment
PPG	Pollution Prevention and Control Guidelines
PPP	Pollution Prevention Plan
PRA	Preliminary bat Roost Assessment
pSAC	Possible Special Area of Conservation
pSPA	Potential Special Protection Area
PUWER	Provision and Use of Work Equipment Regulations
PWS	Private Water Supply
PWTP	Potable water treatment plant
PWR	Pressurised Water Reactor
RBMP	River Basin Management Plan
RCA	Radiation Controlled Area
REPPIR	Radiation (Emergency Preparedness and Public Information) Regulations
RIBA	Royal Institute of British Architects
RICS	Royal Institute of Chartered Surveyors
RIFE	Radioactivity in food and the environment
RSPB	Royal Society for the Protection of Birds
RWMC	Radioactive waste management cases

Term/abbreviation	Definition
R2P2	Reducing Risks, Protecting People
SAP	Safety Assessment Principle
SBL	Scottish Biodiversity List
SCI	Sites of Community Importance
SEMS	Safety and Environmental Management System
SEPA	Scottish Environmental Protection Agency
SFRA	Strategic Flood Risk Assessment
SF_6	Sulphurhexafluoride
SLA	Special Landscape Area
SLR	Single-Lens Reflex
SMP	Shoreline Management Plan
SNH	Scottish Natural Heritage
SO_2	Sulphur Dioxide
SPA	Special Protection Area
SPP	Scottish Planning Policy
SPRI	Scottish Pollution Return Inventory
SPZ	Source Protection Zone
SQEP	Suitably Qualified Experienced Person
SRAM	Safety Report Assessment Manual
SSAFO	Silage, Slurry and Agricultural Fuel Oil
SSSI	Site of Special Scientific Interest
ST	Short-term
SWSEIC	South West Scotland Environmental Information Centre
TAN	Technical Advice Note
TCO	Transport Co-ordination Officer
TPH	Total petroleum hydrocarbons

Term/abbreviation	Definition
TTRO	Temporary Traffic Regulation Order
UKAEA	United Kingdom Atomic Energy Authority
UKCP	UK Climate Projections
UK RWI	UK Radioactive Waste Inventory
UNFCC	United Nations Framework Convention on Climate Change
UST	Underground Storage Tank
VLLW	Very Low Level Waste
VP	View Point
WeBS	Wetland Bird Survey
WeWS Act	The Water Environment and Water Services (Scotland) Act
WFD	Water Framework Directive
WHVDC	Western High Voltage Direct Current
WLA	Wild Land Area
WMC	Waste Management Centre
WPA	Waste Planning Authority
WoSAS HER	West of Scotland Archaeology Service Historic Environment Record
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility

Glossary

Term	Definition
Abnormal indivisible loads (AILs)	Large loads which by their nature cannot be broken into smaller multiple deliveries.
Above Ordnance Datum (AOD)	An Ordnance Datum or OD is a vertical datum used by an ordnance survey as the basis for deriving altitudes on maps. A spot height may be expressed as AOD for "Above Ordnance Datum". Usually mean sea level is used for the datum.
Additional Measures	Further measures required in order to achieve the anticipated outcome. These are referred to as ‘secondary measures’ in accordance with IEMA guidelines.
Agricultural Land Classification (ALC)	A classification of agricultural land in England and Wales according to its quality and agricultural versatility. The classifications range from Grade 1 (the best and most versatile) through Grades 2, 3a, 3b, 4, down to 5 (the least versatile).
Annex I Habitats	Habitats listed in Annex I of the Habitats Directive 92/43/EEC.
Appropriate Assessment (AA)	A process required by the Habitats Directive 92/43/EEC to avoid adverse effects of plans, programmed and projects on Natura 2000 sites and thereby maintain the integrity of the Natura 2000 network and its features.
As Low As Reasonably Practicable (ALARP)	To satisfy this principle, measures necessary to reduce risk must be taken until the cost of these measures whether in money, time or trouble, is disproportionate to the reduction of risk. (Edwards v National Coal Board [1949]).
Baseline	The situation prevailing before the Proposed Works are commenced (the current baseline), and also to the situation that would prevail in the future without the Proposed Works (the future baseline).

Term	Definition
Bathymetry	Describes the 'topography' or profile of the seabed.
Beneficial or Adverse Types of Landscape Effect	The landscape effects may be beneficial, neutral, or adverse. In landscape terms – a beneficial effect would require development to add to the landscape quality and character of an area. Neutral landscape effects would include low or negligible changes that may be considered as part of the 'normal' landscape processes such as maintenance or harvesting activities. An adverse effect may include the loss of landscape elements such as mature trees and hedgerows as part of construction leading to a reduction in the landscape quality and character of an area.
Beneficial or Adverse Types of Visual Effect	The visual effects may be beneficial, neutral, or adverse. In visual terms – beneficial or adverse effects are less easy to define or quantify and require a subjective consideration of a number of factors affecting the view, which may be beneficial, neutral, or adverse. Opinions as to the visual effects of large scale developments vary widely, however it is not the assumption of this assessment that all change, including substantial levels of change is an adverse experience. Rather this assessment has considered factors such as the visual composition of the landscape in the view together with the design and composition, which may or may not be reasonably, accommodated within the scale and character of the landscape as perceived from the receptor location.
Best Available Technique (BAT)	BAT is defined as the most effective and advanced stage in the development of activities and their methods of operation, which indicates the practical suitability of particular techniques for providing, in principle, the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and impact on the environment as a whole.
Best Practicable Means (BPM)	In Scotland, BPM is referred to in place BAT.

Term	Definition
Brownfield Land	Land that has been previously developed is known as Brownfield land.
Conservation Areas	Designated areas of special architectural or historic interest, the character or appearance of which is desirable to preserve or enhance which have protection under legislation.
Carbon Budget	A restriction on the total amount of greenhouse gases the UK can emit over a 5-year period.
CO_2 Equivalent (CO_{2eq})	A metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.
Decarbonisation	The process of reducing the amount of greenhouse gas emissions made.
Degree of change	A combination of the scale, extent and duration of an effect also defined as ‘magnitude’.
Designated Landscape*	Areas of landscape identified as being of importance at international, national or local levels, either defined by statue or identified in development plans or other documents.
Disaster	A natural occurrence that is reasonably foreseeable and leads to serious damage on receptors, either immediate or delayed.
Elements*	Individual parts which make up the landscape, such as, for example, trees, hedges and buildings.
Enhancement*	Proposals that seek to improve the landscape resource of the site and its wider setting beyond its baseline condition.
End of Generation	The date at which HNB ceased generating electricity (Unit 1 ceased generating on 26 November 2021 and Unit 2 on 7 January 2022).
Environmental Impact Assessment (EIA)	An EIA is a tool for systematically examining and assessing the impacts and effects of a development on the environment. The objective of the EIA is to identify any likely significant

Term	Definition
	effects which may arise from the Proposed Works and identify measures to prevent, reduce or offset any adverse effects.
Environmental Statement	The outcome of the EIA process is reported within a document called an Environmental Statement.
Feature*	Particularly prominent or eye-catching elements in the landscape such as tree clumps, church towers or wooded skylines OR a particular aspect of the project proposal.
Field of View	The horizontal angle of the view illustrated in a visualisation.
Final Site Clearance	Final Site Clearance (FSC) involving the deconstruction of the safestore and final decommissioning is estimated to last approximately 12 years in duration and will commence up to 85 years after End of Generation.
Future Baseline	This is the theoretical situation that would exist in the absence of the Proposed Works. This is based upon extrapolating the current baseline using technical knowledge of likely changes over the identified period (for example anticipated habitat change over time, climate change projections, traffic and waste volume growth over time, etc.).
Good Practice Measures	Actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements or actions that are considered to be standard practice used to manage commonly occurring environmental effects. These are referred to as 'tertiary measures' in accordance with the IEMA guidelines and would also be embedded within the design of the Proposed Works.
Groundwater	Water occurring below ground in natural formations (typically rocks, gravels and sands).

Term	Definition
Hazard	Hazard is the potential for harm arising from an intrinsic property or ability of something to cause detriment.
Hazardous Waste	Hazardous waste is essentially waste that contains hazardous properties that may render it harmful to human health or the environment. The European Commission has issued a Directive on the controlled management of such waste (91/689/EEC) and hazardous waste is defined on the basis of a list drawn up under that Directive. Examples include asbestos, lead-acid batteries, oils and solvents.
Heritage	The historic environment and especially valued assets and qualities such as historic buildings and cultural traditions.
Higher Activity Waste (HAW)	Higher activity radioactive waste comprises a number of categories of radioactive waste – High Level Waste (HLW), Intermediate Level Waste (ILW), and Low Level Waste (LLW) that is not suitable for near-surface disposal in current facilities.
Historic Landscape Characterisation (HLC) and Historic Land-use Assessment (HLA)	Historic characterisation is the identification and interpretation of the historic dimension of the present-day landscape or townscape within a given area. HLC is the term used in England and Wales, HLA is the term used in Scotland.
In-combination Effects	In-combination effects are effects that occur as a result of two or more project impacts acting together (i.e.) combined, to result in a new or changed effect on a specific receptor.
Indirect effects*	Direct effects relate to the host landscape and concern both physical and perceptual effects on the receptor. Indirect effects relate to those landscapes and receptors which separated by distance or remote from the development and therefore are only affected in terms of visual or perceptual effects. The Landscape Institute also defines indirect effects as those which are not a direct result of the development but are often produced away from it or as a result of a complex pathway.

Term	Definition
Intertidal	The area of shore between the highest and lowest tides.
Intermediate Level Waste (ILW)	Waste with radioactivity levels exceeding the upper boundaries for Low Level Waste (LLW), but which does not need heating to be taken into account in the design of storage or disposal facilities. ILW arises mainly from the reprocessing of spent fuel, and from general operations and maintenance of radioactive plant. The major components of ILW are metals and organic materials, with smaller quantities of cement, graphite, glass and ceramics.
Intolerable Risk	Above a certain level, a risk is regarded as intolerable and cannot be justified in any ordinary circumstance.
Land cover	The surface cover of the land, usually expressed in terms of vegetation cover or lack of it. Related to but not the same as land use.
Landscape and Visual Impact Assessment (LVIA)	A tool used to identify and assess the likely significance of the effects of change resulting from development both on the landscape as an environmental resource in its own right and on people's views and visual amenity.
Landscape Character Area (LCA)*	These are single unique areas which are the discrete geographical areas of a particular landscape type.
Landscape Character Assessment	The process of identifying and describing variation in the character of the landscape, and using this information to assist in managing change in the landscape. It seeks to identify and explain the unique combination of elements and features that make landscapes distinctive. The process results in the production of a Landscape Character Assessment.
Landscape Character Types (LCTs)*	Distinct types of landscape which are relatively homogenous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and

Term	Definition
	settlement patterns, and perceptual and aesthetic attributes.
Landscape character*	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape effects*	Effects on the landscape as a resource in its own right. An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern here is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. (GLVIA3 2013, Para 5.1).
Landscape patterns	Spatial distributions of landscape elements combining to form patterns, which may be distinctive, recognisable and describable e.g. hedgerows and stream patterns.
Landscape quality (condition)*	A measure of the physical state of the landscape. It may include the extent to which typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.
Landscape qualities	A term used to describe the aesthetic or perceptual and intangible characteristics of the landscape such as scenic quality, tranquillity, sense of wildness or remoteness. Cultural and artistic references may also be described here.
Landscape receptors *	Defined aspects of the landscape resource that have the potential to be affected by a proposal
Landscape resource	The combination of elements that contribute to landscape context, character, and value.
Landscape sensitivity	The sensitivity of the landscape to a particular development considers the susceptibility of the landscape and its value.
Landscape value*	The relative value that is attached to different landscapes by society. A landscape may be

Term	Definition
	valued by different stakeholders for a whole variety of reasons. The value of the Landscape Character Types or Areas that may be affected, based on review of any designations at both national and local levels, and, where there are no designations, judgements based on criteria that can be used to establish landscape value.
Listed Buildings	Buildings and structures which have been identified as being of special architectural or historic interest and whose protection and maintenance are the subject of special legislation.
Low Level Waste (LLW)	Low Level Waste which includes metals, soil, building rubble and organic materials, arising principally as lightly contaminated miscellaneous scrap. Wastes other than those suitable for disposal with ordinary refuse, but not exceeding 4 GBq/tonne (gigabecquerels) of alpha or 12 GBq/tonne of beta/gamma activity. Metals are mostly in the form of redundant equipment. Organic materials are mainly in the form of paper towels, clothing and laboratory equipment that have been used in areas where radioactive materials are used e.g. hospitals, research establishments and industry.
Magnitude of change	XXXX
Major Accident	A reasonably foreseeable but unintended event caused by a man-made activity or asset that leads to serious damage on receptors, either immediate or delayed. The activity causing the event may be either within the project, or external to it.
Marine Environment	Anything below mean high water springs.
Managed Retreat Plan	Phased approach to deconstruction and demolition for the Proposed Works.
Nuclear Site Licence	A formal notification of the authorised body which can operate a nuclear operation under the Nuclear Installations Act (1965).

Term	Definition
Oslo-Paris Conventions (OSPAR)	Oslo-Paris Conventions which established requirements on the level of nuclear and non-nuclear discharges to the marine environment of the North East Atlantic, the North Sea and the Irish Sea.
Perception	Combines the sensory (that we receive through our senses) with the cognitive (our knowledge and understanding gained from many sources and experiences).
Perceptual Aspects	A landscape may be valued for its perceptual qualities, notably wildness and/or tranquillity. (GLVIA3, 2013 Box 5.1)
Photomontage*	A visualisation which superimposes an image of the Proposed Works upon a photograph or series of photographs.
Pre-application Opinion	Informs the requirements of EIA process and ultimately the Environmental Statement (ES) which will be submitted as part of the application. Through the scoping process the views of the statutory consultees and other relevant organisations on the proposed scope of the EIA are sought.
Preparations for Quiescence Phase	Preparations for Quiescence Phase is the first phase of decommissioning and is expected to take up to 12 years after the End of Generation at the Site. The purpose of this phase is to reduce the hazard presented by the radioactive and non-radioactive materials and wastes on the site, and to make preparations to place the site into a passively safe and secure state
Probability of Effect	The probability of a landscape and visual effect occurring as a result of this Development should be regarded as certain, subject to the stated project design and the continuance of the existing, baseline landscape resource, including known changes such as other permitted development. The probability of cumulative effects however is variable. Whereas those effects related to existing development and those under construction are considered as certain, effects related to development with planning consent

Term	Definition
	are only considered as likely. Development sites for which there is a submitted planning application are considered as uncertain and other development for which no planning application has been made are considered as uncertain / unknown, as the level of uncertainty would be greater.
Rarity	The presence of rare elements or features in the landscape or the presence of a rare Landscape Character Type. (GLVIA3 2013, Box 5.1)
Receptor	A built asset, population or environmental aspect that may experience a change in its baseline condition as a result of an activity or impact pathway.
Recreation Value*	Evidence that the landscape is valued for recreational activity where experience of the landscape is important. (GLVIA3 2013, Box 5.1)
Representativeness*	Whether the landscape contains a particular character and/or features or elements which are considered particularly important examples.
Quiescence Phase	The Quiescence phase will commence approximately 12 years after End of Generation, with the site remaining in this passive condition for approximately 70 years under a regime of continuous monitoring and surveillance, with periodic care and maintenance.
Scale Indicators	Landscape elements and features of a known or recognisable scale such as houses, trees, and vehicles that may be compared to other objects, where the scale of height is less familiar, to indicate their true scale.
Scenic quality	Depends upon perception and reflects the particular combination and pattern of elements in the landscape, its aesthetic qualities, its more intangible sense of place or 'genius loci' and other more intangible qualities. (GLVIA3 2013, Box 5.1)
Scheduled Monument	A feature of national, historical or archaeological importance, either above or below the ground. Not all nationally important archaeological

Term	Definition
	remains are scheduled and sites of lesser importance may still merit protection.
Seascape	Landscapes with views of the coast or seas, and coasts and adjacent marine environments with cultural, historical and archaeological links with each other.
Sense of Place (genius loci)	The essential character and spirit of an area: 'genius loci' literally means 'spirit of the place'.
Sensitivity*	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value associated to that receptor.
Serious Damage on the Environment	Loss or significant detriment to populations of species or organisms, valued sites (including designated sites), valued cultural heritage sites, contamination of drinking water supplies, ground or groundwater, or harm to environmental receptors.
Serious Damage to Human Populations	This includes harm which would be considered substantial i.e., death(s), multiple serious injuries or a substantial number requiring medical attention.
Site of Special Scientific Interest (SSSI)	An area designated as being of special interest by reason of any of its flora, fauna or geological or physiographical features.
Site Licence	A nuclear site licence granted by the ONR is a legal document, issued for the full life cycle of a nuclear facility. It contains site-specific information and defines the number and type of installations permitted. Such installations include nuclear power stations (like HNB), research reactors, nuclear fuel manufacturing and reprocessing, and the storage of radioactive matter in bulk.
Site Licensee	The Site Licensee is the holder of the nuclear site licence. The current Site Licensee for HNB is EDF. Following the end of generation and defueling, the Nuclear Decommissioning Authority (NDA) and Magnox Ltd (a subsidiary of

Term	Definition
	the NDA) will become the Site Licensee and the responsible party for implementing decommissioning at the site.
Special Area of Conservation	A site designated via the European Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) (i.e. the Habitats Directive) to protect rare and endangered habitats and species at a European level.
Special Protection Area	Designated under Article 4 of the European Directive on the Conservation of Wild Birds (2009/147/EC) (i.e. the Birds Directive) to protect the habitats of threatened and migratory birds.
Strategic Road Network	The strategic road network (or SRN) is made up of motorways and trunk roads (the most significant 'A' roads).
Subtidal	Areas below water at all states of tide.
Susceptibility*	The ability of a defined landscape or visual receptor to accommodate the specific Proposed Works without undue negative consequences.
Temporary or permanent effects	Effects may be considered as temporary or permanent.
Townscape	The character and composition of the built environment including the buildings and the relationships between them, the different types of urban open space, including green spaces, and the relationship between buildings and open spaces.
True View Visuals	A mobile 3D augmented reality (AR) tool used to aid with the assessment. The True View Visuals tool indicates visibility of the Proposed Works to assist in confirming viewpoint positions as well as indicating limited or no visibility of developments in particular locations. Whilst the images are indicative only, the AR tool provides a comparable image to the accurate wirelines produced.

Term	Definition
Type or Nature of effect	Whether an effect is direct or indirect, temporary or permanent, beneficial (positive), neutral or adverse (negative) solus or cumulative.
Viewpoints	Selected for illustration of the visual effects fall broadly into three groups: Representative Viewpoints: selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ – for example certain points may be chosen to represent the view of users of particular public footpaths and bridleways; Specific Viewpoints: chosen because they are key and sometimes promoted viewpoints within the landscape, including for example specific local visitor attractions, such as landscapes with statutory landscape designations or viewpoints with particular cultural landscape associations. Illustrative Viewpoints: chosen specifically to demonstrate a particular effect or specific issues, which might, for example, be the restricted visibility at certain locations. (GLVIA3 2013, Para 6.19)
Visual amenity	The overall views and surroundings, which provide a visual setting or backdrop to the activities of people living, working, participating in recreational activities, visiting or travelling through an area.
Visual dominance	A visual effect often referred to in respect of residential properties that in relation to development would be subject to blocking of views, or reduction of light / shadowing, and high levels of visual intrusion.
Visual effect*	Effects on specific views and on the general visual amenity experienced by people.
Visual Receptors*	Individuals and/or defined groups of people who have the potential to be affected by a proposal.
Visual sensitivity	The sensitivity of visual receptors such as residents, relative to their location and context, to visual change proposed by development.

Term	Definition
Visualisation	Computer visualisation, photomontage, or other technique to illustrate the appearance of the development from a known location.
Waste Hierarchy	A hierarchical approach to minimise the amounts of waste requiring disposal. The hierarchy consists of non-creation where practicable; minimisation of arisings where the creation of waste is unavoidable; recycling and reuse; and, only then, disposal.
Wireline / Wireframe	A computer-generated line drawing of the DTM (digital terrain model) and the Proposed Works from a known location.
Zone of Influence (ZoI)	An identified geographical area around the Proposed Works where there is a potential for impacts to occur.
Zone of Theoretical Visibility (ZTV)	The likely (or theoretical) extent of visibility of a development, usually shown on a map.

2.

The Decommissioning Process

Appendix 2A: Managed Retreat Plan Building Groups

Appendix 2A
Managed Retreat Plan Building Groups

2A. Managed Retreat Plan building groups

2A.1 **Table 2A.1** presents the buildings with in the HNB Works Area that will be dismantled or demolished in the Preparations for Quiescence phase of the Proposed Works.

Table 2A.1 Managed Retreat Plan building groups

Managed Retreat group	Building
1	Contractor Office Buildings (Doosan)
	Cavendish Nuclear Store/Workshop
	Facilities Management Building (WPS)
	Fish farm
	District Survey Lab (Yorkon)
	New Contractor Compound (outage portacabin village)
	Applus RTD Office/Outage Canteen Cabin
	Ablution Building
	Contractor Store
	Workplace Solutions Store
	Special Waste Compound
	Special Waste Handling & Sorting Facility
2	Stone & Platt & Beel Boiler Houses
	Waste Oil Incineration Building
	3.3kV Diesel Generator Building
	11 kV Diesel House

Managed Retreat group	Building
	New CO2 Storage Plant, vaporisers and vessels (14, 15 & 16)
	Bulk Diesel Storage Tanks 4, 5 & 6 including the pumphouse
	Containerised (Cochran) Aux Boilers
	Liquid O2 Storage Compound
	Fuel Oil and Feedwater Tanks for Aux Boilers
	New CO2 Plant Room
	Alternative Access Control Point Building (ACP2)
	Operations Outage Support Offices
	CNC Forward Response Operating Base (FROB)
3	CW Pumphouse
	BCI Replacement RCW Overground Pipework
	Forebay
	CW Drumscreens
	B Station CW Inlet Culverts
	Intake Land Shaft
	Trash Baskets
	Jetty & Hypochlorite System (CW)
	Townswater Pumphouse (Diesel Pumps)
	11kV Townswater Pumphouse Substation No. 5
	Townswater Buffer Tank
	CW Fire Pump Diesel Fuel Tank
	11kV 415V Townswater Pumphouse Transformers
	Townswater Pumphouse (Elec Pumps)
4	Make Up Water Treatment Plant (MUWTP)

Managed Retreat group	Building
	Reserve Water Feed Tank
	Turbine Oil to Regen and Storage Tanks
	Caustic, Acid and Ammonia Tanks
	H2 Storage Compound
	Ammonia Tank
	Caustic Soda Tank
	Sulphuric Acid Tank
	Filtered Water Tank & Salt Saturation
	Access Control Point Building (ACP)
5	BUCS Diesel House & Control Room
	Old CO2 Storage Plant Room
	CO2 Storage Plant (Vessels 6, 7, 8, 9 & 10)
	Main BUCS Tank and pipe bridge
	Breathing Air Compressor House
	Oil Interceptor Pit (old CO2 Plant)
	R4 DCS dosing tank, pumps diesel tank and portable generator
6	415V Diesel House
	New Nitrogen Plant (diverse hold down)
	CMEC Diesel House
	Bulk Diesel Tanks 7 & 8
	Methane Bottle Store
	O2 Bottle Storage Compound
	Oil Interceptor Pit
	Former N2 Plant Control Room (Redundant)

Managed Retreat group	Building
	O2 Bottle Store
	Oil Interceptor Pit
	Former N2 Storage Plant (Removed)
	Former Propane Store (Removed)
	R3 DCS dosing tank, pumps diesel tank and portable generator
7	Turbine Hall
	Chlorine Monitoring Room (skylab)
8	Workshop and Office Building (maintenance reactor systems)
	Garage and Vehicle Workshop
	Chemistry Lab
	Emergency Vehicle Complex
	Yorkon Building
	Work Execution Centre (WEC)
	Outage Planning Offices
	New Crane and Flask Transporter Housing Building
	Archive Store
	Fire Emergency Training Facility
	Gas Bottle Store
	Highly Flammable Materials Store
9	Gas Circulator Workshop
	GCWS Active Effluent Reception Tank Building
	Flow Loop Simulator Training Facility
	GCWS Offices (Formerly HP Base Facilities)
	Civil Workshop

Managed Retreat group	Building
	Workshop and Offices
	11kV / 415V Workshop transformer 1 & 2
	New Welfare Block & Quality Management Offices
	Main Store & Goods Reception
	Narrow Aisle Store
	Bulk and Heavy Goods Store
	Fuel Station / Civil Workshop Gas Oil Tank
	Various Small Stores (Facilities Oil, Solvent, etc.)
	CNC Base Area Facility (BAF)
	Dosimetry Office
	Modular Office Building (Cox Cabins)
	Old Sodium Hypo Plant
	Riggers Loft
	Chemical Store
	Mechanical/New Riggers Store
	Document Store
10	400kV Switch House
	132kV Switch House
	33kV Switch House
	33kV Substation
	11kV No. 2 Sub-Station (Part of Ring Main)
	11kV No. 3 Sub Station (Part of Ring Main)
	Scottish Power 33 / 11 kV Sub Station (Part of Ring Main)
	11kV Site Supplies Sub-Station
	11kV No.7 Sub-Station (OCC Supplies)

Managed Retreat group	Building
	11kV Fish Farm Substation
	Ex-Inverkip Generator Transformer Phase Store
	Spare Station Transformer Store
	11kV No. 1 Sub Station (Part of Ring Main)
	11kV No. 7 Sub-Station (ID Supplies)
11	Low Level Waste Facility (DWPF during C&M Preps)
	Temp Stator Store (DWPF during C&M Preps)
	Laundry (DWPF during C&M Preps)
	Health Physics Services Building (DWPF during C&M Preps)
	HP Calibration Facility & AHU (DWPF during C&M Preps)
	CW Outlet culvert & land shaft, Anti-Foaming Dosing Plant
	Scaffolding Store
	Syphon Seal Pit
	RAM ISO Compound Supervised Area
	Marine Waste Transfer Facility
	Clean package store (DWPF)
12	Simulator Unit Building
	Training Centre
	Transfer & Deconstruction & ECC2
	Permit Office (Site of Former N2 Vaporiser Plantroom)
	Modular Office Complex (vetting office)
	Fuel Route Improvement Team Office Building
	Extension to Simulator & Training Complex
	Induction Training Centre

Managed Retreat group	Building
13	Septic Tank & Pumping Station
	Storm Water Pumphouse
	ECC
	Admin Building
	Staff Restaurant / Vending Area
	New Station Sewage Plant
	Oil Interceptor Pit (TG7)
	Oil Interceptor Pit (TG8)
	Occupational Health Ambulance Garage
	Lagoon Oil Recovery Unit
	Security Gatehouse Male Welfare Extension
	Shorrocks Security System Control Room
	Main Gatehouse
	Telecoms Equipment Room
	Vehicle Exit Radiation Detection Monitors
	Site Access Turnstiles
	Cycle Shed
	Small Parcels Off-Site Delivery Point
	Railhead Crane

5.

The EIA Process

Appendix 5A: Office for Nuclear Regulation EIADR Pre-Application Opinion Report

November 2023

EIADR PRE-APPLICATION OPINION REPORT			
Unique Doc. ID:	ONR-OFD-AR-22-026	**Issue No.:**	0
Record Reference:	2022/52369		
Project:	EIADR – Pre-Application Opinion		
Site:	Hunterston B Nuclear Power Station		
Title:	Hunterston B Nuclear Power Station - Environmental Statement Pre-Application Opinion		
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Hunterston B Nuclear Power Station

Environmental Statement Pre-Application Opinion

Environmental Statement Pre-Application Opinion Ref.: ONR-OFD-AR-22-026

Issue No.: 0

Date: 04 October 2022

Executive Summary

Permission Requested

EDF Energy (EDFE) has asked the Office for Nuclear Regulation (ONR) to provide an opinion on the proposed format and content of an application for consent to decommission the Hunterston B Nuclear Power Station under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended) (EIADR).

Background

ONR is the enforcing authority for EIADR. EIADR is a legal instrument that requires the environmental impact of decommissioning nuclear power stations, and other nuclear reactors, to be considered in detail before consent for the decommissioning work to commence is given.

Part of the EIADR provides for the applicant to seek the opinion of ONR on what should be included in the scope of the Environmental Statement (ES). EDFE has submitted a Scoping Report to ONR laying out the proposed format and content of their Environmental Statement (ES), and the scope of the EIA, and requested ONR provide a Pre-Application Opinion (PAO).

Assessment work carried out by ONR in the consideration of this request

ONR consulted with the statutory consultation bodies (as defined in regulation 2 of EIADR) and additional consultation bodies with whom ONR considered it appropriate to consult, for a period of one month. Consultation responses were considered and incorporated if deemed appropriate by ONR. Where we have received comments on style or general comments these have been shared as part of the debrief process held with the licensee. All consultation responses have been provided in full to the licensee.

A Technical Support Contractor (TSC) was used to review the scoping report and provide independent expert advice on the submission to help inform ONR's PAO.

ONR has adopted a sampling approach in its review of the scoping report and has provided detailed feedback on the following technical chapters which were deemed to be of the most significance: noise and vibration, socio-economic, marine biodiversity, traffic and transport and air quality.

Conclusions

ONR has developed its PAO on the proposed scope of the ES for the Hunterston B decommissioning project. This includes some recommendations and comments on where the scope of the ES could be expanded or refined, for EDFE's consideration.

List of Abbreviations

AGR	Advanced Gas Reactor
COMAH	Directive" means Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances
DWPF	Decommissioning Waste Processing Facility
EIA	Environmental Impact Assessment
EIADR	Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended)
ES	Environmental Statement
EDF	Électricité de France
EDFE	EDF Energy
GEART	Guidelines for the Environmental Assessment of Road Traffic
ILW	Intermediate Level radioactive Waste
LVIA	Landscape and Visual Impact Assessment
NDA	Nuclear Decommissioning Authority
NPF4	National Planning Framework (draft 4)
ONR	Office for Nuclear Regulation
OWPF	Operational Waste Processing Facility
PAO	Pre-Application Opinion
SEPA	Scottish Environment Protection Agency
SPA	Special Protection Areas
SSSI	Site of Special Scientific Interest
TSC	Technical Support Contractors

Table of Contents

1. Introduction

1.1. Issue

1. EDF Energy (EDFE) has asked the Office for Nuclear Regulation (ONR) to provide an opinion on the proposed format and content of an application for consent to decommission the Hunterston B Nuclear Power Station under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended) (EIADR).

1.2. Background

2. ONR is the enforcing authority for EIADR. EIADR is a legal instrument that requires the environmental impact of decommissioning nuclear power stations, and other nuclear reactors, to be considered in detail before consent for the decommissioning work to commence is given.

3. An application for consent under EIADR will primarily include an Environmental Statement (ES), which presents an Environmental Impact Assessment (EIA), for the project. The information to be included in an ES is referred to and specified in Schedule 1 of EIADR, this can be found in Appendix 1 of this report. The application for consent is subject to stakeholder consultation before consent is granted.

4. EIADR provides for the applicant to seek the opinion of ONR on what should be included in the scope of the Environmental Statement (ES). EDFE has submitted a Scoping Report to ONR laying out the proposed format and content of their ES and requested ONR provide a Pre-Application Opinion (PAO) .As part of the PAO process, ONR is required to seek the opinion of key stakeholders via a consultation.

2. Approach

2.1. Consultation

5. ONR has consulted with the statutory consultees (as defined in regulation 2 of EIADR) and other bodies with whom ONR considered it appropriate to consult, for a period of one month. The list of consultees is provided in Appendix 2.

6. ONR received a number of responses from the consultation. Consultation responses were considered and incorporated if deemed appropriate by ONR. Where we have received comments on style or general comments these have been shared as part of in debrief process held with the licensee.

A general summary of consultation responses can be found in Appendix 3. All consultation responses have been provided in full to the licensee.

2.2. Use of a Technical Support Contractor

7. A TSC with expertise in EIA was used to review the scoping report and provide an independent review of the submission to help inform ONR's PAO.

3. ONR's Pre-Application Opinion

8. The Hunterston B scoping report presents the proposed format and content of an application for consent to decommission the Hunterston B Nuclear Power Station under EIADR.

9. After due consideration of the scoping report, and taking into account comments received from the consultation and the expert EIA advice received from the TSC, ONR found the proposed scope to be generally appropriate, but a few specific points and issues that should be addressed in the ES were highlighted .

10. ONR's opinion is provided below; the comments have been presented to align with the structure of the scoping report. ONR's response to this scoping document is via recommendations and comments; recommendations are areas where the scope of the ES should be reviewed, comments are additional suggestions on areas where improvements could be made.

3.1. Comments and recommendations:

11. Overall, the scoping report provided is considered appropriate at this stage, although there are a number of areas that will require attention in the ES, these have been highlighted in the sections below which follow the same format as the scoping report. ONR notes that the proposed scope of the ES is presently quite broad, possibly due to uncertainties in the decommissioning methodologies to be used, and there should be an opportunity to refine this through the EIA process.

3.1.1. The Decommissioning Process

3.1.1.1. Site location and context

12. There is a high-level description of the site area and the context of the surrounding area. The information provided does not indicate whether there are any special scientific interests or designated areas. Any such areas should be identified and described.

3.1.1.2. Description of the decommissioning process

13. It is recommended that this chapter should clearly distinguish what activities are included in the scope of EIADR and what are out of scope and covered by other legislation. For example, the ES should make it clear what action constitutes the commencement of the EIADR project.

14. ONR notes that EDFE has scoped the ES against a current baseline, however it is noted that this baseline may change between now and the completion of the ES for the EIADR application. The ES submitted to ONR must be based on an up to date baseline.

15. Further recommendations and comments on the current and future baseline is provided in the feedback on the technical chapters.

16. There is limited information on the traffic and transport requirements during decommissioning. ONR understands that there are uncertainties on the levels of traffic during decommissioning and the transport requirements to support the project, however, there may be a range or an assumption on traffic levels and transport requirements, or a worst-case scenario, that the EIA can be based on. Further information on the assumptions made during the EIA should be provided in the ES.

17. Hunterston B is part of a fleet of Advanced Gas Cooled Reactors (AGRs) currently operated by EDFE. The current strategy for the AGR fleet is that they will be transferred from EDFE to Nuclear Decommissioning Authority (NDA) ownership and will then be operated by Magnox Ltd. This transfer will take place following completion of defueling. ONR notes that there are uncertainties for future activities in the decommissioning project, where the activities will take place after the site has transferred to the NDA ownership. The ES could also provide information on how the EDFE has engaged with the NDA and Magnox Ltd to date, and how these organisations will progress the decommissioning project once they take ownership of the site, including the review and management of any uncertainties.

18. It is recommended that the ES provides further information on the use of the existing infrastructure to support decommissioning activities. For example, the ES should provide information on whether the current access roads are suitable to support decommissioning activities even if there are uncertainties associated with this.

19. In addition to this, information on the need for any associated developments and additional land use requirements are not included in this section. It is recommended that the ES should make it clear if there are any associated developments required at each stage of the decommissioning project and what the potential environmental impact of such a development is.

20. It would be useful for the scoping report to include information on indicative employment numbers (both temporary and permanent workforce) throughout the decommissioning phases as this would provide further context to the scoping of the socio-economic assessment. ONR appreciates that there may

be uncertainties at this stage, but an indicative range or assumption could have been included. The ES should include information on any assumptions made for employment numbers in the EIA.

21. It is recommended that each of the section areas summarise the mitigation methods that have been identified or are being considered to demonstrate that environmental effects are being minimised or avoided..

3.1.1.3. Waste Management

22. The scoping report states that there are studies ongoing to confirm the requirement of an Operational Waste Processing Facility (OWPF) on site. The intermediate level radioactive waste (ILW) generated from decommissioning during the “Preparations for Quiescence Phase” would be processed in this facility and therefore the use of this facility would be in scope of EIADR. The Scoping Report states that this facility’s construction may overlap with the end of defueling and that the construction of the OWPF would be consented under the Town and Country Planning (Scotland) Act 1997 (as per Table 3.1 in the Scoping Report). However, it is not clear if this consent will require an EIA under the Town and Country Planning Regulations, and whether the timing of the construction of this facility means that it will also need to be included in the scope of the EIADR project. EDFE should provide clarity on this aspect in the ES.

23. Alternative options to the OWPF are to use waste processing facilities at the adjacent Hunterston A site or use a new Decommissioning Waste Processing Facility (DWPF). ONR notes that section 2.4 of the scoping report provides more information on the DWPF which provides information on the accommodation of the DWPF within existing plant on site. It would be useful for the ES to highlight the environmental benefits of this approach.

24. The approach to managing the decommissioning waste during the ‘Preparations for Quiescence Phase’ should be confirmed in the ES. The Hunterston A site is currently decommissioning and is in scope of EIADR; if facilities on the Hunterston A site are to be used then this should be considered in terms of the potential cumulative impacts of the two decommissioning projects.

25. The scoping report states that it is assumed that ILW generated during the Preparations for Quiescence Phase will be stored in the Hunterston A ILW Store; this is subject to further development work and regulatory approval. The ES should include information on the potential environmental impacts/benefits of using the Hunterston A ILW Store and what the alternative options for ILW management are in the case that this approach is not taken. The scoping report noted that new facilties would be required to process the accumulated operational waste that would arise.

3.1.1.4. Deplanting and Deconstruction

26. A high-level description of the buildings requiring demolition is provided here but there are uncertainties on the exact methods that will be used. It is not clear what assumptions have been made on the methodology for deplanting and deconstruction to inform the EIA scoping. The ES should make it clear where there are uncertainties in the future decommissioning techniques and how these uncertainties will be managed.

27. There is no description of the construction/deconstruction methods that will be used in the decommissioning project other than the potential use of explosives in the marine environment chapter. It would have been useful for the scoping report to include information on the methods that will be used, or assumptions on the methods that may be used, to provide context on the scope of the EIA. ONR considers that the ES should provide information on the construction and deconstruction methods that will be used throughout the decommissioning project and the potential environmental impacts of these methods.

3.1.1.5. Safestore Construction

28. The Safestore structure which will be constructed over the reactor buildings to protect them from the weather conditions for the duration of the Quiescent Phase will have a 100-year design life. The scoping report does not include consideration of the resilience of the Safestore and other facilities such as the OWPF and DWPF to climate change. The ES should include information on how the design of facilities on site for the duration of the Quiescent Phase ensures resilience against future climate change and more extreme weather events.

3.1.1.6. Enabling Projects

29. The Scoping Report provides a high-level overview of the enabling works that will be required to support decommissioning including new active effluent discharge arrangements, OWPF and DWPF. It is not clear if these activities are in scope of the EIADR project and/or if they will be permissioned under the Town and Country Planning Regulations. ONR notes that work is ongoing to identify the location of these activities and the method for how they will be implemented, however if they are in scope of EIADR, then they should be included within the Indicative Dismantling Works Area (red boundary area) (Figure 1.1) in the ES.

3.1.1.7. Final Site Clearance

30. The Final Site Clearance section states that at this point some works may be required to de-contaminate land on site to enable the requirements of the ‘Guidance on Requirements for Release of Nuclear Sites from Radioactive Substances Regulation’ to be met. Clarity is required regarding the use of in-situ disposal or disposal for a purpose in terms of GRR, this should be made clear in the ES. Consideration will also need to be given to delicensing requirements relevant to ONR. In addition to this, the ES should make it

clear what activities will be required at this stage to enable the site to be delicensed and when these activities are expected to be carried out.

31. The scoping report refers to the Scottish Government Higher Activity Radioactive Waste Policy (2011) and the assumption that a near-surface facility for the management of higher activity waste will be available to receive the ILW generated at Final Site Clearance. Given the long timescales of the decommissioning project, the ES should set out how government policy will be kept under review for the duration of the project as changes may impact future decommissioning and waste management activities.

32. ONR appreciates that due to the long timescales of the decommissioning project, there are currently uncertainties about the later stages of the project but we expect the ES to include information on how future decommissioning phases will be reviewed and re-assessed, and reported.

3.1.1.8. Development of Decommissioning Strategy

33. The scoping report provides an overview of the decommissioning approaches that have been considered and the reasons that they have been discounted or selected, this is useful information to include in the scoping report to provide context for the planned approach to decommissioning. It would be useful for the ES to make it clear what engagement has been undertaken between EDFE and the NDA on the decommissioning strategy for the site and how this has influenced the development of the decommissioning strategy.

34. In addition to this, it would be useful for information on the decommissioning strategy to be included upfront in the ES as this will provide context for the approach to decommissioning.

3.1.2. Legislative Context

35. Paragraph 3.2.3 of the scoping report lists the EU Directives that are implemented by UK domestic legislation and are therefore relevant to the decommissioning project. It would be useful for the ES to state how these directives are implemented in UK law (i.e. the relevant regulations), why these apply to the EIADR project and how they have been considered in the EIA.

36. In addition to this, it would be useful for the ES to include a description of how the assessments undertaken under the Habitats Regulations, Water Framework Directive and Environmental Authorisations (Scotland) Regulations interact, for example where assessment findings have been shared and used within the EIA.

37. The Legislative Context section provides tables summarising relevant national policy and development policy (Tables 3.2 and 3.3); it would be

useful for the ES to state why each policy is relevant to the project and how it has been considered in the EIA.

38. The consultation identifies some legislative refences which are not applicable to Scotland. For example, in Chapter 11 the Environmental Protection Act cannot be used to consider a risk assessment framework for land contamination.

3.1.3. EIA Process

39. The assessment methodology presented in chapter 4 of the scoping report follows good practice and clearly sets out the criteria to use for determining sensitivity, magnitude of change and significance level. Paragraph 4.4.14 clearly sets out what level of effect is considered to be significant.

40. Within the technical chapters, there is some repetition of the information presented in Chapter 4 and there is some inconsistency with the presentation of the significance matrix in some technical chapters but not others. Receptor sensitivity is also missing from some of the chapters.

41. ONR notes that, while this is not included in the scoping report, the ES would benefit from a summary, for example in a table format, of the receptors/ environmental areas have been assessed and where these have been considered in the technical chapters. This would provide a useful guide, particularly for consultees who will want to focus on specific aspects of the report, to where information can be found. It would also indicate where there are interfaces between different topic areas for example between costal management and water quality (Chapter 9) and surface water and flood risk (Chapter 10).

42. The scoping report describes the temporal scope of the project and how environmental effects will be compared to the situation prevailing before the decommissioning project commences (the current baseline), and to the situation that would prevail in the future without the decommissioning project (the projected future baseline). However, no description of how the environmental baseline has been established to inform the scoping process is provided. Please see ONR's comments on the Technical Chapters for further feedback on the projected future baseline.

43. EDFE recognises that interim consideration of the evolving baseline will be required due to the extended duration of the decommissioning project; interim reviews will be built into the decommissioning programme and refinements to assessments implemented as necessary. ONR considers that understanding the evolving baseline over the long timescales of the decommissioning project is an important factor and it is good to see this recognised here. The ES should make it clear how uncertainties in the future baseline prediction will be managed as the project progresses.

44. The project is split into three discrete phases of work, the preparation for the quiescent phase (~12 years), the quiescent phase (~70 years) and the final site clearance phase (~12 years). ONR notes that each of the technical chapters has considered the EIA scope for all three decommissioning project phases, however, it is not clear which year within these phases has been used to scope the EIA. It is good practice to consider the 'worst case' year when assessing environmental impact.

3.1.3.1. Assessment of effects and determining significance

45. The scoping report provides an overview of the methodology that will be used for assessing environmental effects and the proposed assessment methodology follows good practice.

46. The project has a ~96 year period and is split into three discrete phases of work, the preparation for the quiescent phase, the quiescent phase and the final site clearance phase. Each technical chapter refers back to Chapter 2 of the Scoping Report when referring to the temporal scope of the assessment and have considered each phase of the Project (however this is unclear in some chapters). However, as noted in an earlier comment, it is not clear which points in time in each phase within the project duration have been used as the basis for the assessment. In addition, the majority of chapters conclude that the future baseline is hard to predict and so the current baseline was used for scoping. It is not clear whether this approach will also be used for the EIA and this should be clarified in the ES. If a future baseline cannot be determined at this stage, the ES should set out how this limitation is to be managed.

3.1.3.2. Environmental Measures

47. The definition of mitigation measures considered in the EIA process is clearly set out in this section.

3.1.3.3. Assessment of Cumulative Effects

48. The proposed methodology to define the types of development for the assessment of cumulative effects is considered appropriate. ONR notes that a zone of influence for determining cumulative effects is defined in Figure 4.1 but a rationale for this zone has not been provided in the scoping report, nor has a review of the potential significant effects been conducted. The scoping report does clarify that in the ES the zone of influence will be defined by each environmental topic and be combined into a single area. This approach is deemed appropriate.

49. It would have been beneficial for the scoping report to provide an understanding of what potential significant environmental effects could arise for both intra and inter-project cumulative impacts, with a clear statement concluding that these assessments are scoped into the EIA. Within the ES,

the scope of the cumulative impact assessment should be clearly set out, and a proportionate approach should be applied.

3.1.3.4. Transboundary Effects

50. It is not clear if Transboundary Effects have been scoped in or out of the EIA; the report states that they are unlikely but does not make a clear statement on the inclusion of transboundary effects in the scope of the EIA. This should be clarified in the ES.

51. The information in the scoping report (section 4.7) is focused on potential doses to members of the public but the assessment of potential transboundary effects should consider potential significant effects on all environmental and social aspects. This should be considered further in the EIA process. If the effects can be scoped out of the EIA, further engagement with the ONR should be sought and the ES should capture the rationale.

3.1.3.5. Radiological Effects

52. Section 4.8 states that radiological discharges (solid, liquid and gaseous) and their impacts are assessed in detail during the process for applying for a permit (or a variation) under the Environmental Authorisations (Scotland) Regulations 2018 and are regulated by the Scottish Environment Protection Agency (SEPA) through routine regulatory interactions, and are therefore scoped out of the EIA.

53. Section 4.8 also states that the effects of working with ionising radiation as a result of the decommissioning works is also scoped out of the EIA as they are specifically regulated by ONR under the Ionising Radiation Regulations 2017 and through compliance with the site licence conditions. ONR considers the rationale for both aspects to be reasonable.

54. The description of the scope would benefit from clear statements about how other radiological effects, such as radioactive waste management, and the management of contaminated land are considered in the scope of the EIA and an explanation of where this is covered in the technical chapters. This could be clarified in the ES.

3.2. Technical Chapters

3.2.1. General comments:

55. The following general feedback applies to the technical chapters in the scoping report:

- A justification of the Study Area (for scoping purposes) has not been provided for each environmental aspect.

- The proposed baseline data to be collected to inform the EIA process and the methodology for baseline data collection has not been provided in each technical chapter.
- The approach to identifying the environmental management and control measures that could be incorporated into the decommissioning project has not been provided in each technical chapter.

56. The future baseline is required to understand the likely evolution of the environment without the implementation of the project so that future phases of a project can be assessed against a reference point. The future baseline has been considered for each topic in the scoping process which is considered good practice. Most topics have included a 'without scheme' scenario (e.g. Air Quality), however the Climate Change section states that the 'without scheme' is unrealistic as it is Government Policy to decommission the site. A consistent approach should be applied to the assessment, and if it differs, a justification should be provided in the ES.

57. The majority of the chapters conclude that long-term changes in the baseline cannot be predicted and therefore the current baseline will be used for the assessment. It is unclear if this was for the scoping process or if it is the approach for the EIA. It is appreciated predicting the future baseline is challenging for many topics and receptors, however further evidence to understand why this is the case should be provided in the ES. If this is the approach for the EIA, this is a limitation to the assessment, which should be clearly accounted for in the ES.

58. The ES should provide a clear justification of how the study areas were defined and set out the baseline for the EIA, focusing on the receptors and resources that could be significantly affected. As per section 4.5 of the scoping report, the ES should include a description of the mitigation measures that will be implemented to minimise the environmental impact of the project.

59. The purpose of the scoping report is to set out the environmental issues that should be assessed further as they have the potential to be significantly affected by the decommissioning project, with the overall aim of having a proportionate and focused ES. ONR considers that the proposed scope of the ES set out in each technical chapter of the Scoping Report is quite wide. This may be due to insufficient baseline information to enable understanding of what impact an activity could cause and what receptors could be affected. There is opportunity to refine the scope through the EIA process.

60. The scoping report does not detail how uncertainty will be managed in the scoping phase or in the EIA. Given the long timescales of the decommissioning project, having uncertainty is acceptable, however it is important to detail how uncertainty is addressed. If a methodology for managing uncertainty was set out and assumptions made to accommodate

these limitations, this may support the conclusions drawn on why certain receptors are scoped in or out of the EIA.

61. There is potential to reduce the scope through the EIA process, in particular scoping out phases for some topics as well as scoping out some receptors and activities. Once further information becomes available, EDFE should aim to refine and finalise the scope of assessment, so that a proportionate ES (that documents significant effects) can be delivered to the ONR.

3.2.2. Detailed Feedback

62. ONR has not reviewed every technical chapter in detail but has adopted a sampling approach of topics deemed to be of the most significance: noise and vibration, socio-economic, marine biodiversity, traffic and transport, and air quality. Detailed feedback is provided on these technical chapters, and some high-level comments are provided on others.

3.2.2.1. Air quality

63. ONR received a consultation comment that the impact of air emissions and depositions on designated sites should be considered as part of the EIA. This should be considered in the ES.

64. ONR considers that the scope of assessment which sets out activities that will generate road traffic emissions is suitable, but the ES should include a clearly defined and justified study area.

65. The potential receptors include human and ecological receptors. The scoping report states that key transport routes have been identified and will be confirmed as part of the iterative EIA process, along with any additional sensitive human receptors. This is an acceptable approach. ONR notes that the ES should define the human receptors as there is uncertainty as to whether other sensitive human receptors have been considered other than residential properties.

66. The determination of significance for dust effects and road traffic emissions is mostly considered appropriate, however there are omissions regarding how significance will be determined with respect to impacts on nature conservation sites and short-term impacts on human health receptors from road traffic emissions.

67. The ES should also detail why the monitoring data presented is suitable, and how the EIA has considered the data particularly when some of the data was collected from kerbside sites in urban areas while the proposed project is in a rural coastal setting.

68. The air quality chapter concludes that the impacts of dust emissions from demolition activities, earthworks, construction, track out and road traffic emissions, and the effects on both human and ecological receptors are

scoped in. Point source emissions of combustion products and their effect on human and ecological receptor; effects of climate change on air quality; and effects of pollutant emission from non-road mobile machinery are scoped out of the assessment. The proposed scope is considered appropriate.

3.2.2.2. Climate Change

69. In addition to the comments raised on the resilience of the Safestore to climate change, the EIA should consider available climate change data already in the public domain such as the 2018 Ayrshire Shoreline Management Plan. In addition to this, the EIA should take into account potential “soft” coastal management techniques deployed in the area to manage coastal flooding.

70. Please also see the comments on the section on soils, geology and hydrology chapter regarding the potential impacts of climate change on groundwater on the site.

3.2.2.3. Terrestrial and freshwater Biodiversity

71. Following a review from a consultee, it is suggested that the following Special Protections areas (SPA) can be scoped out of the EIA. These are the Renfrewshire Heights SPA , Arran Moors SPA and Ailsa Craig SPA due to the distance from the site.

72. The scope of the assessment includes the effects on birds, recognising that this spans terrestrial, freshwater and marine environments, this is considered appropriate. However, please see ONR’s opinion on the scope of the marine biodiversity topic area and the consideration of potential impacts on diving birds.

73. ONR considers that the scope of the potential biodiversity receptors that may be affected by the decommissioning project is appropriate, and EDFE has provided a justification for the receptors scoped out. ONR notes that more detail on the sensitivity of the receptors should be provided in the ES to support conclusions on the significance of the potential environmental impacts.

74. ONR received a consultation response reflecting positively on the inclusion of the terrestrial, freshwater and marine biodiversity receptors covered in the scoping report, including biodiversity sites (International to local), coastal habitats and species, intertidal habitats and species, subtidal habitats and species, vegetation, fish populations, marine mammals, otters, badgers, bats, breeding birds and wintering/passage birds.

75. In addition to this, the consultation response welcomed EDFE’s commitment to protect existing biodiversity features during the decommissioning process, as well as following its completion. The response noted that in line with the draft National Planning Framework (NPF4) that is currently being developed

by the Scottish Government, there is notable opportunity through this proposed decommissioning project to deliver positive effects for biodiversity and suggested that opportunities are investigated for the enhancement of habitats and species on the site during the long decommissioning process.

76. ONR supports these comments and notes that the scoping report recognises NPF4 as a relevant policy to the decommissioning project and identifies the policy issues related to terrestrial and freshwater biodiversity (e.g. Natural Places and Blue and Green Infrastructure).

3.2.2.4. Marine Biodiversity

77. ONR notes that birds are not covered in the marine biodiversity chapter and are instead covered in Chapter 7: Terrestrial and Freshwater Biodiversity. This is considered an acceptable approach but impacts on diving birds should be assessed in the EIA e.g. underwater noise effects, potential for disturbance of sediments, and adverse effects on prey species.

78. ONR notes that the study area to inform the scope of the EIA for marine biodiversity is not clearly defined and more information should be provided on this for the ES. Further to this, information on the baseline is provided and refers to the habitats in the vicinity of the site presented in Figure 8.1. This figure identifies a 'discharge boil area' but it is not clear from the scoping report what this is, and how it impacts on marine biodiversity. This should be explained in the ES.

79. In determining the significance of an effect on potential receptors, the report states in paragraph 8.5.10 that ecological features that are not considered 'important' from a geographic context are those that are sufficiently widespread, unthreatened and resilient and will remain viable and sustainable irrespective of the decommissioning project. ONR notes that all marine receptors that are potentially affected by the project should be included in the scope and cannot be scoped out on the basis that they are widespread. The ES should provide further clarity on the term 'importance' in the context of a receptor sensitivity.

80. During the removal of marine structures, there is a potential for nearby sediment to be disturbed and suspended in the water column. It is not clear from the scoping report whether any sampling of the sediment has been undertaken to understand the potential for the mobilisation of existing contamination in the sediments. Consideration of changes in water quality due to suspended sediments should also be included in the ES.

81. As reported in Table 8.8 of the Scoping Report, there is potential that explosives could be used in the marine environment. This may result in disturbance to marine fauna as a result of underwater noise. The impact of noise and vibration on marine fauna, and physical harm/damage to marine habitats and species as a result of the use of explosives should be

assessed, along with the possible disturbance to sediment and potential contaminant release.

82. ONR received a consultation comment that EDFE should ensure engagement with the relevant bodies on the proposals for remedial work on offshore infrastructure to ensure that the known non-native species within this region are not spread from this area.

83. Further to this, a consultee responded with a suggestion that the ES reviews the local Sites of Special Scientific Interest (SSSI) in the vicinity of the site and includes an assessment of the impacts of water and airborne pollution (including noise and light), as well as hydrodynamic change, both direct and indirect impacts. ONR agrees with this suggestion.

84. As the site is no longer operating, the thermal plume from the warmer cooling water effluent being discharged into the marine environment has ceased. Whilst the impact of this activity ending on marine habitats and species is out of scope of EIADR, it would be useful to understand how this has been considered in establishing the current baseline for the EIA. In addition to this, section 8.3.11 states that seaweed removal campaigns will cease during the decommissioning project. Consideration as to how this may alter the existing habitat at the site needs to be considered when establishing current and future baselines and the potential effects on the marine environment as a result of this should also be considered in the EIA.

3.2.2.5. Coastal Management and Water Quality

85. Comments have been made under the climate change and marine biodiversity section that are relevant to these topic areas.

3.2.2.6. Surface Water and Flood Risk

86. It noted that the Hunterston A and B use the same sewage treatment works; consideration needs to be given to higher tides and high rainfall due to climate change, which could result in the potential increase in surface water discharges from both sites simultaneously, in the EIA.

3.2.2.7. Soils, Geology and Hydrogeology

87. It is unclear if radiological contamination is considered in the scope of this chapter. ONR notes that contaminated radiological runoff is considered in Chapter 9 Coastal Management and Marine Quality. The ES should clearly demonstrate how the potential impacts of radioactive contamination of groundwater, surface water and land have been assessed and where this is described within the report. A rationale should also be provided for the study area for receptors associated with contaminated land.

88. It was identified via the consultation responses that there was a potential for cross contamination from other radioactive sources outside the current

permitted site boundary, including a closed former landfill and in respect to the 39” outfall and its two associated lagoons which were not fully considered in the report. In addition, the ES should provide further detail on the interactions with Hunterston A regarding receptors and co-polluters and the interactions with potential sources of radioactive contamination. The assessment should also consider the risks posed by existing contamination and how the contamination may change over time.

89. A consultee recommended that the 2020 geotechnical investigation report and previous ground investigations identified in the 2020 report referred to in the Land Quality Assessment are taken into account as part of the EIA. ONR agrees with this suggestion.

90. The soils, geology and hydrology chapter states that there are no viable hydrological pathways to the surface water environment, but it is unclear whether the potential for hydraulic connection via shallow groundwater has also been taken into consideration as the scoping report does not review the potential for hydraulic connection between the superficial and bedrock aquifers. In addition to this, consideration of groundwater in the superficial deposits is limited to the east of the site. The ES should provide a justification as to why this is not considered for the wider site.

91. It is recommended that EDFE clarifies the claim that there is no private water supply within 1km of the site. A consultee identified a potential reservoir within 1km to the southeast of the site.

92. EDFE should review the existing groundwater dataset for the site to identify if there are any gaps or areas of uncertainty as this will help to determine if additional investigations or monitoring is required to inform the EIA Consideration needs to be given in the EIA to the potential effects of climate change on the local hydrogeology regimes such as changes to recharge and sea level rises that may influence the groundwater regime.

93. The scoping report states in the Deplanting and Deconstruction section that below ground structures will be left in situ and voids will be backfilled with demolition material. ONR notes that the soils, geology and hydrology section considers the impacts of removing foundation slabs and drains, but not the impacts of leaving them in situ. Consideration of the re-use of site material as in-fill will require appropriate assessment and management to ensure the materials are suitable for the proposed usage and will not pose any unacceptable risks to the water environment. ONR notes that this will also require a permit and will need to be included in the Waste Management Plan and the Site-Wide Environmental Safety Case. This should be clarified and appropriately assessed in the ES.

94. In addition to this, it is recommend that the following information is included as part of the overall assessment of environmental impacts:

- Before any works starts, the boundary of any area of SSSI which might be affected, be clearly marked and contractors advised not to enter it or use it for storage.
- If crushed stone and recycled aggregates are to be used to construct hard-standing areas, they should be sourced from materials free from contaminants, so that there is no possibility of run-off onto the intertidal areas of the SSSI.
- Any materials from the decommissioning of structures should be sensitively re-used on land and or disposed of appropriately and not released onto the intertidal areas of the SSSI.

95.

3.2.2.8. Historic Environment

96. ONR received a consultation response reflecting positively on the proposed scope and assessment methodology presented in the 'Historic Environment' chapter of the scoping report. The response noted that the scoping report identified some nationally important heritage assets in paragraph 12.6.11 for which it is considered that a more detailed assessment will be required to understand if this impacted by the decommissioning project.

3.2.2.9. Landscape and Visual Impact Assessment (LVIA)

97. Consideration should be given in the ES to landscape and visual impacts on the landscape in the area including relevant Nation Science Areas (NSAs) within a 20Km zone.

98. The EIA should consider a landscape and habit enhancement strategy including proposals for a landscape and ecology migration and monitoring arrangements.

3.2.2.10. Noise and Vibration

99. The EIA needs to consider noise and vibrations effects on the local marine species for potential disturbance whilst carrying out pipe and below waterline decommissioning. See the additional comments on this topic area in the marine biodiversity section.

100. ONR notes that while the study areas set out in the methodology are suitable for the assessment, there is no substantiation as to why these distances were applied. This should be provided in the ES. Further to this, it is not clear how the spatial scope of the traffic noise assessment will be determined, this should be clarified in the ES. The receptors listed in Table 14.8 include receptors outside the 2km distance from the works area used for the study area but a rationale for this has not been included. A rationale

would be useful to include in the ES to determine if the scope of the EIA is proportionate.

101. When determining the future baseline, it is stated that the Preparations for Quiescence Phase is expected to be the worst-case phase for the decommissioning project with respect to noise and vibration effects as a result of the substantial dismantling, demolition and construction activities. The ES should clarify if a specific 'worst-case' year within this phase of work has been used for the purpose of the assessment.

102. Paragraph 14.6.6 states that potentially significant effects could occur during the decommissioning project cross all three phases but the Quiescence Phase and Final Site Clearance Phase are then scoped out of the EIA. A clear scope should be provided in the ES along with evidence for phases of the work being scoped out.

103. The proposed methodology meets industry good practice and follows widely accepted standards. However, the ES should provide more detail on the methodologies to define high, medium, low or negligible magnitudes of impact and receptors sensitivities have been applied in the assessment. ONR also notes that paragraph 14.5.7 and section 3.1.4 describe how uncertainty is managed if there is unavailable information on plant, however, they do not provide detail on how the assessment will accommodate this uncertainty. This should be explained in the ES.

3.2.2.11. Traffic and Transport

104. The use of a combination of traffic data sources with October 2021 counts, and a mix of Automatic Traffic Counts and Manual Counts ranging from 2017 to 2020 is deemed suitable data to inform the scoping process.

105. For determining the future baseline, reference is made to estimating future year traffic flows for the years under assessment which will use growth factors based on Nature Trip End Model growth rates. Clarification on which future years will be assessed should be provided in the ES.

106. Further information on the source of the information presented in Table 15.6 detailing Receptor Sensitivity would be beneficial. Table 15.7 details the sensitivity of roads in the study area and states whether Rule 1 or 2 of the GEART applies. In the absence of predicted traffic flows from decommissioning project, further information could be provided on the method used to determine the application of Rule 1 or 2.

107. Table 15.8 details the magnitude of change but does not include the potential impact of hazardous loads; ONR would expect to see the impact of hazardous loads considered in the EIA.

108. In terms of the assessment scope, further information should be provided on the definition of the study area and the temporal scope of traffic and transport impacts.

109. ONR considers the scoping out of rail and marine routes to be suitable. The A78 south of West Kilbride is scoped out as there are limited receptors along the route and much of the route is a dual carriageway. ONR considers that this is reasonable but notes that this may have been prematurely scoped out as traffic numbers are yet to be determined.

3.2.2.12. Socio-Economics

110. Based on the information provided in this chapter, the potential socio-economic effects identified are appropriate. However, as the socio-economics chapter also considers health, this section would benefit from greater consideration of the health consequences of the effects. For example, greater consideration of policy relating to health outcomes, and technical guidance relating to assessing health impacts could be included in the ES.

111. In the data gathering methodology, reference to national statistics and datasets are appropriate. There is opportunity for the ES to expand on this by identifying local businesses, settlements and community facilities that could be impacted by the decommissioning project.

112. Information provided on the current health baseline could include information on different population groups, behaviour risk factors, child health indicators and limiting long-term health problems.

113. The information provided in the 'influence of Hunterston B' section to help define the current baseline is very helpful and helps to provide context for the presentation of the baseline data. The information in Table 16.10 and Table 16.11 is useful in looking from 2022 to 2026. However, no information is provided on the future decades of decommissioning activity on site that are described in Chapter 2. In addition to this, the baseline section discusses change to permanent members of staff, but it is not clear how many temporary staff will be required to undertake the activities described in Chapter 2. Paragraph 16.5.3 states that 'work is on-going to estimate the workforce profile required for decommissioning'. This seems to be an information gap that may lead to a change in scope for the assessment for potential effects relating to socio-economics, communities and health. The ES should make it clear how uncertainties have been managed in the EIA, and how any assumptions will be reviewed as the decommissioning project progresses.

114. The factors identified as influencing magnitude are considered to be appropriate. The magnitude ratings for employment are set out but not for other potential effects. Similarly, definitions for sensitivity criteria for

employment receptors are provided, but not other receptors; this should be clarified in the ES.

115. In the consideration of potential receptors, ONR notes that additional consideration of specific population groups that could be more vulnerable to socio-economic impacts would be beneficial.

116. There is also an opportunity to link some of the potential socio-economic effects to some likely positive outcomes, such as increased opportunities for training and skills development, which may mean that receptors such as the providers of education, training and transitional support services are introduced as receptors.

117. In receptors scoped out of the assessment, there is no discussion of whether residents and visitors to the area may experience potential socio-economic effects due to new (temporary or permanent) activities at the site. Information on distances to local residential areas, construction and commuting routes and cross-references to findings from related assessments (e.g. noise, traffic and transport) would assist in justifying if this is scoped into or out of the assessment.

3.2.2.13. Major Accidents and Disasters

118. No comments.

3.2.2.14. Waste (Conventional and Radioactive)

119. To provide context for the scope of the EIA, it would have been useful to provide information and assumptions on the types and volumes of waste that will be generated throughout the decommissioning project.

120. In terms of waste management activities, additional clarity is required regarding the use of the Safestore and whether it will also include storing debris wastes.

121. In addition to this, the ES should consider the impact of the location of the OWPF and DWPF in respect of potential climate change impacts, for example rising sea levels.

122. The ES should include the potential environmental benefits of managing waste via off-site facilities (for example waste sent off-site for incineration, storage and disposal), rather than building new facilities on site.

123. The scoping report states that on-site disposal of low activity waste is not part of the current proposals but may be considered in the future for the decommissioning process and therefore is scoped out of EIADR. As raised in the comments on the Soil, Geology and Hydrology chapter, the use of in-situ disposal for below ground structures should be clarified in the ES and should be assessed if this approach is being taken.

124. It is also not clear how the potential impacts of the waste generated from the remediation of contaminated land will be considered in the assessment; if this will be included in the scope of the waste chapter then this should be made clear in the ES.

3.3. Other considerations

125. There are some potential topics that do not appear to have been considered (or considered sufficiently) in the scoping report. These are:

- Human health impacts
- Impacts on fishing, maritime recreation and maritime commercial services
- Material and resources use
- Marine archaeology and shipwrecks

126. It may be that these topic areas have been scoped out of the assessment but that this has not been explicitly stated. However, ONR considers that EDFE should consider whether these topics need to be included within the scope.

4. Next stages of the EIADR Process

127. When appropriate, the licensee will progress with the production of the ES and submit this to ONR as an application for EIADR consent. The ES is subject to a 90-day public consultation, following which ONR will make a decision on whether to grant consent for the decommissioning project described.

5. Contact Information

128. [redacted]

129. General information on EIADR can be found at: https://www.onr.org.uk/eiadr.htm

Appendix 1 – Schedule 1 of the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended)

Regulation 17: Schedule 1

Regulations 5(1)(f) and 10(1)

Information which may need to be included in an environmental statement

1. A description of the project, including in particular—

   a) a description of the location of the project;
   b) a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
   c) a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;
   d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases.

2. A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the licensee, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.

4. A description of the factors specified in regulation 10B(3) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example

greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.

5. A description of the likely significant effects of the project on the environment resulting from, among other things—

   a) the construction and existence of the project, including, where relevant, demolition works;
   b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
   c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
   d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);
   e) the cumulation of effects with other existing or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;
   f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;
   g) the technologies and the substances used.

   The description of the likely significant effects on the factors specified in regulation 10B(3) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protection objectives established in retained EU law or under the law of any part of the United Kingdom which are relevant to the project.

6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are

avoided, prevented, reduced or offset, and should cover both the construction and operational phases.

8. A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to retained EU law such as any law that implemented the COMAH Directive or the Nuclear Safety Directive or other relevant environmental assessments may be used for this purpose provided that the requirements of any law that implemented this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.
   In this paragraph-
   "the COMAH Directive" means Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC[3];

   "the Nuclear Safety Directive" means Council Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations[4] as amended by Council Directive 2014/87/Euratom[5].
9. A non-technical summary of the information provided under paragraphs 1 to 8.

10. A reference list detailing the sources used for the descriptions and assessments included in the report."

[3] *OJ No L 197, 24.7.2012, p. 1.*
[4] *OJ No L 172, 2.7.2009, p. 18.*
[5] *OJ No L 219, 25.7.2014, p.42.*

Appendix 2 – Consultees on the Scoping Report

Statuary Consultees

North Ayrshire Council
Inverclyde Council
Renfrewshire Council
East Renfrewshire Council
East Ayrshire Council
South Ayrshire Council
Argyll and Bute Council
Scottish Natural Heritage (Nature Scot)
Scottish Environment Protection Agency (SEPA)

Other Consultees

Ayrshire and Arran NHS Board
Ayrshire Radiation Monitoring Group
Civil Aviation Authority
Clyde Muirshiel Regional Park
Crown Estates
Cumbrae Community Council
Food Standards Scotland
Friends of the Earth (Scotland)
Glasgow Airport
Glasgow Prestwick Airport
Greenpeace
Historic Environment Scotland
Largs Community Council
Marine Scotland
National Air Traffic Services
National Grid
Police Scotland
Scottish Ambulance Service
Scottish Environment Protection Agency
Scottish Fire and Rescue Service
Scottish Government :- Radioactive Waste and Nuclear Decommissioning Dept
:- Directorate for Environment and Forestry
Scottish Natural Heritage
Scottish Power
Scottish Water
The Health and Safety Executive
Transport Scotland
West Kilbride Community Council
Hunterston A Site Stakeholder Group

Hunterston B Site Stakeholder Group
Magnox Ltd.
Ministry of Defence
Nuclear Decommission Authority
Nuclear Free Local Authorities
Peel Ports
RSPB Scotland
Scottish Wildlife Trust

Appendix 3 – General Comments from Consultees on the Scoping Report

ONR received 7 responses from our consultation exercise. The following summarises their response:-

- For those that responded, the Consultees welcomed the chance to comment on the report.
- A consultees highlighted the need for a marine licence regarding aspects covering the infilling of tunnel and pipes below the Mean highwater Springs tide and any proposed temporary or permanent deposits or constructions below the Mean highwater Springs.
- It was noted that the heritage assets highlight in the report were the most likely to be impacted by the proposed work.
- A consultee noted the opportunity through this proposed decommissioning project to deliver positive effects for biodiversity but asked the duty holder to investigated opportunities for the enhancement of habitats and species on the site during the long decommissioning.
- A consultee identified that useful guidance can be found at : General pre-application and scoping advice for onshore wind farms | NatureScot

Appendix 5B: Hunterston B Decommisioning Pre-Application Opinion Response

November 2023

Technical Note: Hunterston B Decommissioning: Pre-application Opinion Response

1. Introduction

1.1 Overview

1.1.1 EDF Energy Nuclear Generation Limited (hereafter referred to as the 'Applicant') is applying for consent from the Office for Nuclear Regulation (ONR) to decommission the Hunterston B Nuclear Power Station (hereafter referred to as 'HNB'). Decommissioning works at HNB which are subject to ONR consent are referred to as the 'Proposed Works'. The Proposed Works will include the dismantling and deconstruction of buildings and structures in areas within and outside of the Nuclear Site License (NSL) boundary (defined and referred to hereafter as the 'Site') that are part of the power station, and include both the marine and terrestrial environments. To assist the identification of these areas for assessment, an Indicative Dismantling Works Area (hereafter referred to as the 'Works Area') has been identified.

1.1.2 Specifically, the Proposed Works occurring in the marine environment include the decommissioning and dismantling (to seabed level or an appropriate shallow depth below seabed level) of existing marine structures comprising of the Cooling Water Intake and Outfall Tunnels, and the HNB jetty. Infrastructure below the seabed will remain in-situ.

1.2 Purpose of this Technical Note

1.2.1 A Scoping Report[1] was prepared to support a request by the Applicant pursuant to Regulation 6(1) of Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended[2]) (hereafter referred to as 'EIADR') for a written Pre-application Opinion to be provided by the ONR with respect to the scope of the Environmental Impact Assessment (EIA) for the Proposed Works. Consequently, the ONR consulted with relevant bodies and issued the Applicant with a Pre-application Opinion.

1.2.2 Within the Pre-application Opinion, the ONR cited a specific point (see **Table 1.1**) relating to additional topics that, in the opinion of the ONR were not addressed sufficiently within the Scoping Report and that were therefore to be considered in the EIA. The Applicant consulted with the ONR in December 2022 on this matter and agreement was sought for the Applicant to submit a Technical Note, to provide clarity on the scoping in or out of these topics. The Technical Note will be appended to the Environmental Statement (ES) as evidence.

[1] EDF Energy Nuclear Generation Limited. 2022. *Hunterston B Nuclear Power Station – Scoping Report.*

[2] UK Government. 1999. *Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended)* [Online]. [Accessed: 30/03/2023]. Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made

Table 1.1 HNB Pre-application Opinion responses relevant to this Technical Note[3]

Pre-application Opinion Reference	ONR Comment
Section 3.1.3.4 Transboundary Effects, Paragraphs 50 and 51	*"It is not clear if Transboundary Effects have been scoped in or out of the EIA; the report states that they are unlikely but does not make a clear statement on the inclusion of transboundary effects in the scope of the EIA. This should be clarified in the ES.* *The information in the scoping report (section 4.7) is focused on potential doses to members of the public but the assessment of potential transboundary effects should consider potential significant effects on all environmental and social aspects. This should be considered further in the EIA process. If the effects can be scoped out of the EIA, further engagement with the ONR should be sought and the ES should capture the rationale."*
Section 3.3 Other Considerations, Paragraph 125	*"There are some potential topics that do not appear to have been considered (or considered sufficiently) in the scoping report. These are:* *Human health impacts* *Impacts on fishing, maritime recreation and maritime commercial services* *Material and resources use* *Marine archaeology and shipwrecks."*
Section 3.3 Other Considerations, Paragraph 126	*"It may be that these topic areas have been scoped out of the assessment but that this has not been explicitly stated. However, ONR considers that EDFE should consider whether these topics need to be included within the scope."*

1.3 Structure of this Technical Note

1.3.1 This Technical Note is structured to provide analysis and response to the topic areas identified in **Table 1.1**, as follows:

- Marine archaeology;
- Material resource use;
- Impacts on fishing, maritime recreation and maritime commercial services;
- Human health;
- Transboundary effects; and
- Summary.

[3] Office for Nuclear Regulation. 2022. *Hunterston B Nuclear Power Station - Environmental Statement Pre-Application Opinion*.

2. Marine archaeology

2.1 Baseline

2.1.1 The area of coastline on which HNB is located was the subject of a combined desk-based and walkover rapid coastal zone assessment between October and December 2002[4], although land within the Nuclear Site Licence Boundary was not included in the survey owing to the presence of HNB. While the marine zone was not surveyed, marine features were recorded if they were identified in desktop studies or field survey.

2.1.2 Relevant historic environment records were consulted via UKHO Wreck and Obstruction data[5], Historic Environment Scotland's (HES) Pastmap[6] resource to a distance of 3 km from the HNB shoreline into the Firth of Clyde. These include records in Canmore[7] and Canmore Maritime, and records of Historic Marine Protected Areas and Protected Military Remains, in addition to local heritage records held and curated by West of Scotland Archaeology Service (WoSAS).

2.1.3 There are no designated heritage assets located within the Works Area. Fish traps (282002) are recorded on historic OS mapping and verified by the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS). A modern dolphin landing stage (282004) is recorded on the OS map of 1987 and is still extant. Stoney Port landing point (282000) is included in the Old Ayrshire Harbours gazetteer[8] though no further detail is supplied on the date or usage of the harbour.

2.1.4 No Canmore Maritime records are located within 1 km of the adjacent shoreline to HNB. An "old Fisherman's Anchor" was recorded at Twelve Foot Spit off Little Cumbrae Island (250374), approximately 2.1 km north-west of the Site. A record located at Fairlie Roads (302703), 2 km north-east of the Site, relates to a yacht lost in 1984. UKHO wreck data identifies this wreck as the yacht Carronade, lost in 1984 while under tow approximately 2 km north of the HNB outfall. Canmore records the wreck of a Brig (transport vessel) off Little Cumbrae (327365) 2.6 km north-west of the Site, and UKHO notes a small number of wrecks including a crane barge, unidentified steel vessel and barge at Little Cumbrae (all over 3 km south-west of the HNB outfall), and a 'Spanish galleon' at Portencross, 2.75 km south of the HNB outfall.

2.1.5 Recorded features are listed in **Table 2.1**.

[4] Sneddon, D. 2003. *Coastal Zone Assessment Survey, Firth of Clyde,* GUARD, Glasgow University, Project 1309

[5] Admiralty Maritime Data Solutions. 2023. *Global Wrecks and Obstructions Shapefile*. [Online]. [Accessed: 03/02/2023]. Available at: https://datahub.admiralty.co.uk/portal/apps/sites/#/marine-data-portal/items/849d10996ccd45178f68403415f1032e

[6] Historic Environment Scotland. 2023. *Past Map Exploring Scotland's Historic Environment*. [Online]. [Accessed: 26/01/2023]. Available at: https://www.pastmap.org.uk/

[7] Canmore. 2023. *About* Canmore. [Online]. [Accessed: 26/01/2023]. Available at: https://canmore.org.uk/content/about

[8] Graham, Angus 1984. *Old Ayrshire Harbours*, Ayrshire Collections Vol. 14, No. 3 Ayrshire Archaeological and Natural Historical Society

Table 2.1 Recorded Features

Source	Reference	Name/Description	Easting	Northing	Distance to Works Area
Canmore Maritime	282002	Fish Trap Hunterston, Tidal Ponds	217921	651625	c.50 m
Canmore Maritime	282004	Dolphin landing stage	217677	651656	c.100 m
Canmore Maritime	282000	Stoney Port landing point	217901	651707	c.50 m
Canmore Maritime	250374	Anchor 'old fisherman's anchor', cast iron, well rusted: found on seabed at Twelve Foot Spit, Little Cumbrae Island, Firth of Clyde.	215822	652488	c.2.1 km
Canmore Maritime	302703	Carronade: Fairlie Roads, Firth Of Clyde The yacht *Carronade*: this vessel foundered off Hunterston, 29 August 1984	218608	653328	c.2 km
Canmore Maritime	327365	*Hound* Brig, Stranded at the south end of Cumbrae.	215619	652684	c. 2.6 km

2.1.6 The near shore waters in which the Proposed Works will be undertaken mean that the seabed environment is mobile and the limited depth of sediment over bedrock means that survival of archaeological remains in any coherent form would be limited. The construction of the marine infrastructure associated with the Hunterston A (HNA) and HNB would have given rise to substantial further disturbance, although this can be expected to have been localised around the existing infrastructure.

2.1.7 The Firth of Clyde's intense historic use indicates the presence of marine archaeological remains on the sea-bed cannot be ruled out. However, for the reasons given above, the potential is limited within the Works Area and other than the fishtraps (282002) and more recent landing stages (282004, 282000) there are no recorded marine archaeological remains within 100 m of the Works Area.

2.2 Scope in or out of further assessment

2.2.1 Localised seabed disturbance associated with the Proposed Works will only arise where dismantling requires the use of plant that would be supported by or secured to the seabed (such as the use of jack-up barges), or through direct disturbance of the seabed to dismantle structures via dredging or vibro-piling. As decommissioning is anticipated to involve removal of marine structures, namely the intake and jetty, to seabed level only, resulting disturbance would therefore effectively be contained within the Works Area, which has already been disturbed by the initial construction and on-going maintenance of the existing infrastructure.

2.2.2 No significant historic environment impacts are anticipated based on the baseline assessment. Nonetheless, to ensure that unforeseen marine archaeological remains can be appropriately identified and recorded if they are encountered during the Proposed Works, a Protocol for Archaeological Discovery (PAD) setting out the approach to the reporting and subsequent treatment of unexpected archaeological discoveries should be in place during the Proposed Works within the marine environment. The PAD will be included in the Environmental Management Plan (EMP) for the Proposed Works.

2.3 Summary

2.3.1 While no marine archaeological remains are anticipated within the Works Area, the history of the Firth of Clyde and presence of maritime records in proximity to the Site means the presence of remains on the seabed cannot be ruled out completely. No further assessment is considered to be necessary and the implementation of a PAD would provide adequate mitigation.

3. Material resource use

3.1 Baseline

3.1.1 HNB falls within the unitary planning authority area of North Ayrshire Council, who are the statutory body responsible for the management and delivery of mineral planning applications and development in line with national targets[9].

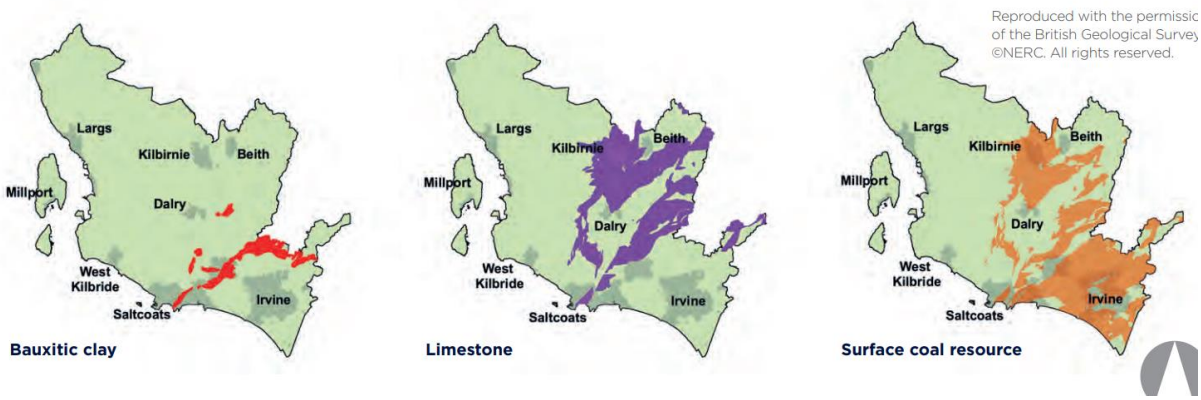
3.1.2 The North Ayrshire Local Development Plan (LDP) (adopted 2019)[10], shows there are no economically viable mineral resources within the Works Area or any safeguarded mineral areas within the local planning authority area. Whist the LDP contains policies to support mineral planning applications, supporting evidence such as annual monitoring reports to indicate consistent supply of current and future mineral reserve is not available or largely out of date.

3.1.3 There are no safeguarded economically viable mineral resources within North Ayrshire. Therefore, the Proposed Works are very unlikely to sterilise any significant / economically viable existing mineral deposits within and surrounding the Site. **Graphic 3.1** shows deposits of existing mineral resource across North Ayrshire, which substantiates this assumption.

[9] Local mineral planning authorities are required to ensure there is a sufficient landbank and supply of aggregates (limestone, clay, rock, sand and gravel) over at least a 10-year period at all times in relevant market areas. In Scotland, National Planning Policy requires Local Development Plans to support the extraction of mineral and the maintenance of permitted reserves in accordance with national policy, however there is no national mechanism to provide an overall assessment of future construction aggregates.

[10] North Ayrshire Council. 2019. *Adopted Local Development Plan*. [Online]. [Accessed: 30/03/2023]. Available at: https://www.north-ayrshire.gov.uk/Documents/CorporateServices/LegalProtective/LocalDevelopmentPlan/ldp2.pdf

Graphic 3.1 Deposits of existing mineral resource across North Ayrshire



3.1.4 The latest national survey of Scottish aggregates resources was conducted in 2012[11] within the British Geological Survey (BGS) Mineral Planning Factsheet[12]. The collation of results on consented reserves are considered on a regional level and North Ayrshire falls within the West Central Scotland B and Dumfries & Galloway regional area. **Table 3.1** shows estimated reserves in active sites in 2012. It also shows an active quarry within this area for sand and gravel, except this information is preserved for confidentiality.

Table 3.1 Estimated consented reserves in active sites in Scotland (S = suppressed to preserve confidentiality)

Region	Thousand tonnes		
	Sand and Gravel	Crushed Rock	Total
Argyll and Bute	S	S	S
Forth Valley	S	0	S
Highland and Moray	5,430	23,205	28,635

[11] Scottish Government. 2015. *Scottish Aggregates Survey 2012*. [Online]. [Accessed: 30/03/2023]. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/statistics/2015/06/scottish-aggregates-survey-2012/documents/00479064-pdf/00479064-pdf/govscot%3Adocument/00479064.pdf

[12] British Geological Society. 2019. *Mineral Planning Factsheet Construction aggregates*. [Online]. [Accessed: 30/03/2023]. Available at: https://www2.bgs.ac.uk/mineralsuk/download/planning_factsheets/mpf_aggregates.pdf

Region	Thousand tonnes		
North East Scotland	4,151	240,792	244,943
Orkney and Shetland Islands	0	S	S
SESplan	16,768	21,809	38,577
TAYplan	10,460	17,193	27,653
West Central Scotland A	18,791	81,627	
West Central Scotland B and Dumfries and Galloway	S	18,131	S
Western Isles	123	2,770	2,893
Total	60,842	410,427	471,269

3.1.5 Notwithstanding the time period that has passed since the publication of the data provided in **Table 3.1**, the data does indicate that sand and gravel and crushed rock aggregates are available across many regions in Scotland and that supply is not restricted.

3.1.6 Data from the BGS[13] in 2020 indicates a number of mineral operators across Scotland (from 2019). It also shows a number of operators working within North Ayrshire (see **Table 3.2**), which suggests raw aggregates and mineral (limestone, crushed rock, silica sand, clay, sand and gravel) is available and can be sourced locally.

[13] British Geological Society. 2020. *Directory of Miens and Quarries*. [Online]. [Accessed: 30/03/2023]. Available at: https://www2.bgs.ac.uk/mineralsuk/download/dmg/Directory_of_Mines_and_Quarries_2020.pdf

Table 3.2 Mineral operators and raw aggregates/minerals extracted in the North Ayrshire Council area

Operator	Name of working	Commodity
Breedon Northern	Swinless Quarry	Igneous and Metamorphic Rock
Hugh King and Co.	Garnock West Quarry	Sand
Hugh King and Co.	Hullerhill Sand Quarry	Silica Sand
Leith's (Scotland) Ltd.	Trearne Quarry	Limestone
W H Malcolm Ltd.	Loanhead Quarry	Igneous and Metamorphic Rock
John Thomson Construction Ltd.	Bogary Quarry	Igneous and Metamorphic Rock
John Thomson Construction Ltd.	Dereneneach Quarry	Igneous and Metamorphic Rock
John Thomson Construction Ltd.	Mid Sannox Quarry	Sand and Gravel
Smith Skip Ltd.	Knowes Farm Clay Pit	Clay and Shale

3.1.7 Whilst there is no recent data to demonstrate how much economically viable mineral reserve is available in North Ayrshire, data from the BGS (and more historic information published by Scottish Government) indicate that a variety of primary aggregates and mineral sites that are available in the region within which North Ayrshire sits.

3.1.8 It should also be noted that EDF has indicated that approximately 10,200m^3 of clean rubble derived from demolition is suitable for re-use on site as fill material. This re-use of onsite material will substitute a proportion of the currently anticipated imported fill material requirements, amounting to approximately 53,500 m^3 in total if on-site voids need to be filled prior to entry into the Quiescence phase.

3.2 Scope in or out of further assessment

3.2.1 The Proposed Works involve the construction of waste processing facilities and cladding of the Safestore with a requirement that materials (aggregates/mineral) are imported to the Site for these purposes.

3.2.2 Whist the data presented in **Section 3.1** indicates mineral is available locally and regionally, the type and volume of material required to be imported to the Works Area has not been fully defined.

3.2.3 To robustly assess the likely significant effects on material resource locally and regionally, the type and volume of material required needs to be specified. In the absence of this information at the EIA Scoping stage a precautionary approach has been taken, which scopes materials resource use into the EIA. This assessment will assess the level of burden that the Proposed Works would place on local/ regional sources of raw building materials, with established landbanks for differing materials representing the assessed receptors.

3.3 Summary

3.3.1 The scope of the materials resource impact assessment assesses the potential impact of the type and quantity of raw materials required as a result of the Proposed Works and how this would impact on existing mineral reserve, operators and active quarries.

3.3.2 In the absence of reliable data at the EIA Scoping stage, it was not possible to identify how much material would be available and how many active mineral quarries / operators are currently active in North Ayrshire. Also unknown at the EIA Scoping stage, was the type and volume of material required to support the construction of new buildings over the decommissioning period. Sufficient detail is now available to inform assessment in the ES.

3.3.3 Based on these conclusions, material resource use is scoped into the EIA and will form an appendix to the Conventional Waste ES chapter.

4. Impacts on fishing, maritime recreation and maritime commercial services

4.1 Baseline

Fishing

4.1.1 HNB is located near the head of the Clyde basin, where the Firth of Clyde opens out. It falls within ICES statistical Rectangle 40E5[14], which is the highest resolution dataset available for this location, though it encompasses a coastal area from Greenock to Troon, including Greater Cumbrae. More site-specific information has been obtained from other publicly available data sources, including recent EIAs for other relevant projects.

4.1.2 The finfish fishery in the Clyde collapsed in the mid-20th century and commercial activity is now dominated by shellfisheries, particularly for Norway lobster *Nephrops norvegicus*[15]. Other important species (in terms of value) include *Ensis* razor clams, scallops and crabs. Smaller quantities of lobster *Homarus ammarus*, spiny lobster *Palinurus elephas*, brown shrimp *Crangon crangon*, pink shrimp *Pandalus borealis* (northern prawn), squat lobsters and squid are also taken[16].

4.1.3 Data for landings in 40E5 over the period 2014 to 2018 show that *Nephrops* is the most important species, with razor clams increasing in importance in recent years. In 2018, *Nephrops* landings represented 58% of the commercial value and razor clams almost 40%.

4.1.4 Fishing activity occurs throughout the Firth of Clyde, with the main landing ports at Campbeltown, Tarbert, Troon and, Ayr, and some smaller fishing ports located at Greenock, Largs and Rothesay. The closest port to HNB is Largs. Annual landings at Largs from 2012-2018 varied between approximately 148 and 241 t, representing an annual value of £800,000 - £1.05 million[16].

4.1.5 A closed season to all fishing has been enforced to protect spawning cod over much of the Firth of Clyde, between 14 February and 30 April 2023, and season closure will likely be enforced in subsequent years. However, the closed area does not currently extend as far north as HNB[17].

4.1.6 While fishing in the Firth of Clyde is not evenly distributed, it is worth noting that a substantial proportion of the landings at Largs are associated with smaller vessels (less than 10m) that have the capability to fish in the shallow water off HNB. Data from Marine Scotland indicates that from 2010-2020, an annual average of approximately 65 hours of effort was spent by boats trawling for crustaceans in the

[14] International Council for the Exploration of the Sea (ICES) Statistical rectangles, available at: https://www.ices.dk/data/maps/Pages/ICES-statistical-rectangles.aspx. [Accessed 23.05.23]

[15] British Sea Fishing. 2022. *The Decline of the Firth of Clyde*. [Online]. [Accessed: 23/01/2023]. Available at: https://britishseafishing.co.uk/the-decline-of-the-firth-of-clyde/

[16] Royal Haskoning DHV. 2020. *Millport Coastal Flood Protection Scheme: Environmental Statement. Chapter 12 Commercial Fisheries*. Ref. PB4749-RHD-ZZ-XX-RP-Z-0012

[17] Scottish Government. 2022. *Clyde cod spawning closures*. [Online]. [Accessed: 20/01/2023]. Available at: https://www.gov.scot/publications/clyde-cod-spawning-closures/

channel between Great and Little Cumbrae and HNB[18]. It is expected, therefore, that some small boats fish for *Nephrops* in the vicinity of the Proposed Works, using either mobile gear or creels.

4.1.7 Recreational sea angling takes place in the Firth of Clyde with dogfish and small whiting and summer mackerel making up most of the catch[15].

Maritime recreation

4.1.8 Marine tourism is a significant economic activity for Scotland. In 2017 it employed 28,300 people and generated £594 million in Gross Value Added (GVA), making up 14% of the £4.1 billion GVA from all Scottish tourism[19]. Recreational activities are a fundamental component of marine tourism and are also enjoyed by residents.

4.1.9 The area off the coast of HNB is one of the most intensively used in Scotland for marine recreation. **Graphic A4.1 (**see **Appendix A)**, shows a 'heat map' for marine recreational activities from the "*Scottish Marine and Recreation Tourism Survey*"[20] with a range showing greater levels of use in red to lower levels of use in green. After the red areas of greater use in the areas near Oban, the area near HNB is amongst the next most intensively used in all Scotland.

4.1.10 The 24 types of recreational activities used to generate the heat maps are listed in **Table A4.1**. Historically, the Firth of Clyde has been a major UK centre for recreational boating. The types of maritime recreational activities related to boating have changed over time and presently, in addition to yachts which are moored afloat for the season in marinas and at individual moorings, there are smaller craft normally stored ashore but with a range of different characteristics and use, such as smaller power boats, sailing dinghies, kayaks, rowing boats, and kite-surfing equipment. The use of many of these are related to activities close to the coastline. Other maritime recreational activities may require the use of boats, such as water-skiing, but others can equally be conducted from the land, such as wildlife watching, art and photography, beachcombing, and swimming (including wild swimming).

4.1.11 In the vicinity of the Works Area, an important change since the completion of the Scottish Marine and Recreation Tourism Survey is the closure of the Scottish National Watersports centre at Millport on Greater Cumbrae at the end of 2020. As of March 2023, the site is currently offered for sale.

4.1.12 Other marine recreational activities are not directly affected by the closure and many of those listed in the Scottish Marine and Recreation Tourism Survey are important in the Study Area. The types of activities reflect the general context and broader history of maritime recreation in the area which is likely to continue as it is based on the physical features of the geography and the location of population centres, even while the varieties of activities may change over time.

4.1.13 A more detailed heat map for the area local to the Site near the Isle of Arran, is shown in **Graphic A4.2**. It shows that the coastal area near the Works Area is a contiguous and forms part of the overall marine recreational resource.

[18] Marine Scotland. 2022. *Average intensity (hours) of fishing using ICES VMS data sets*. [Online]. [Accessed: 23/01/2023]. Available at: https://marine.gov.scot/information/average-intensity-hours-fishing-using-ices-vms-data-sets

[19] Marine Scotland Assessment. 2020. *Marine Tourism*. [Online]. [Accessed: 27/03/2023]. Available at: https://marine.gov.scot/sma/assessment/marine-tourism

[20] Marine Scotland Information. 2016. *Scottish Marine Recreation & Tourism Survey 2015*. [Online]. [Accessed: 26/03/2023]. Available at: https://marine.gov.scot/information/scottish-marine-recreation-tourism-survey-2015.

4.1.14 Heat maps are available for the marine recreational activities listed in **Table A4.1** above and are also presented in **Graphic A4.4** – **Graphic A4.26**, but exclude #10 ("Other unclassified activities") as being overly non-specific. Two heat maps (**Graphic A4.16** and **Graphic A4.22**) present important land-based and marine-based activities. They comprise detail within the overall picture of "combined activities" presented in **Graphic A4.1** and **Graphic A4.2.**

4.1.15 The heat map for specific activity of "walking at the coast" (activity #20) is shown in **Graphic A4.22**. It shows that the coastal area near the Site is of particular relevance.

4.1.16 The heat map for specific activity of "Sailing and cruising at sea including dinghies" (activity #14) is shown in **Graphic A4.16**. It shows that the coastal area near the Site is amongst the areas with highest use.

4.1.17 Vessels of many countries are automatically tracked using the Automatic Identification System (AIS) and data collected over time indicates the intensity of use of particular sea areas and can be presented as a heat map. Data can be categorised for particular types of vessel. **Graphic A4.3** shows AIS data presented as average weekly density of recreational vessels over the period 2012 – 2017. The two squares east of the islands of Great and Little Cumbrae by the Site are two of the three most intensively used on the West Coast of Scotland by recreational vessels. The islands effectively divide commercial traffic to the west from recreational traffic to the east. The map supplements and confirms the results of the Scottish Marine and Recreation Tourism Survey[20].

Maritime commercial services

4.1.18 Maritime commercial services are identified based on the categories listed as "Productive" in data provided by Marine Scotland within the "National Marine Plan Interactive" (NMPI)[21]. The list of categories and whether they are a relevant to consider as a "maritime commercial service" is provided in **Table 4.1**.

Table 4.11 Categories identified as "Productive" in Marine Scotland NMPI mapping service

#	Categories identified as 'Productive'	Relevant "maritime commercial service"?
1	Aquaculture	Yes
2	Seaweed Harvesting and Cultivation	Yes
3	Fishing (Commercial Sea Fishing)	Yes, covered under fishing above
4	Salmon and Trout Fishing	Yes
5	Marine Tourism, Leisure and Recreation	Yes, covered under maritime recreation above
6	Historic Environment and Cultural Heritage	Not considered here (see Section 2).

[21] Marine Scotland. 2023. *Maps NMPI part of Scotland's environment*. [Online]. [Accessed: 27/03/2023]. Available at: https://marinescotland.atkinsgeospatial.com/nmpi/default.aspx?layers=1041

#	Categories identified as 'Productive'	Relevant "maritime commercial service"?
7	Coastal Protection and Flood Defence	Not considered here (Considered under the relevant Environmental Aspect chapter of the ES).
8	Renewable Energy and Power Cables	Yes
9	Carbon Capture, utilisation and Storage	Yes
10	Oil, Gas, Pipelines and Gas Storage	Yes
11	Water Abstraction	Yes
12	Waste Disposal (Dredge Material)	Yes
13	Maritime transport (Ports and Shipping)	Yes
14	Waste Disposal (Waste Water Treatment and Industrial)	Yes
15	Defence (Military)	No (no commercial aspects related to defence)
16	Telecommunications Cables	Yes
17	Aggregates	Yes

4.1.19 The baseline information for maritime commercial services which are likely to be unaffected by the Proposed Works is presented first using bullet point summaries. Other information is presented using summaries and graphics according to the level of relevant detail. The phrase "in the vicinity" reflects a professional judgement as to the possible extent of effects but can be understood to mean within a distance of a minimum of 5 km from the Works Area, but can be further dependent on the category. **Graphic B4.1 – Graphics B4.10** in **Appendix B** present the spatial context of the relevant categories presented in **Table 4.11**.

4.1.20 The following activities and resources are identified on Marine Scotland mapping but are not within the Study Area:

- Marine aggregates: No marine aggregates are currently being or have been historically extracted.
- Renewable energy resources: No wave, wind or tidal lease sites.
- Seaweed: No licence areas.
- Carbon capture and storage: No licence areas.
- Oil and Gas: No licensed blocks.
- Dredge spoil disposal sites: No sites (see **Graphic B4.1**).

4.1.21 The following activities and resources are in the vicinity and so may be relevant to the Proposed Works:

- Subsea power cables: The nearest subsea power cables run west and south from a landfall on the coast near West Kilbride (See **Graphic B4.2).**
- Coastal water abstraction points: The nearest abstraction points to the Site are south of Saltcoats and north of Rothesay (See **Graphic B4.3**).
- Oil & Gas: A subsea pipeline runs from Largs to Greater Cumbrae.

4.1.22 There are a number of ports within the Port of Glasgow harbour area (see **Graphic B4.4**).

4.1.23 There are two Shipbuilding and repair yards on the coast between Largs and the Site (see **Graphic B4.5**).

4.1.24 There are a number of anchoring areas and berths in the vicinity (See **Graphic B4.6**).

4.1.25 Navigation channels run both sides of the islands of Great and Little Cumbrae (See **Graphic B4.7**).

4.1.26 Vessel data monitored using the Automatic Identification System (AIS) is presented for the sea area near the islands of Great and Little Cumbrae and shows significant traffic to the west and east (see **Graphic B4.8**). More detailed information (not shown) indicates that larger vessels such as tankers take routes west of the islands. It can be seen that there are very few routes close inshore near the Site.

4.1.27 There are a number of waste-water treatment plants (See **Graphic B4.9**).

4.1.28 There are a number of telecommunications cables (See **Graphic B4.10**).

4.2 Scope in or out of further assessment

Fishing

4.2.1 To minimise the environmental impact to the marine environment, it is proposed that marine structures, namely the intake and jetty are removed to seabed level, or a suitably safe level below the seabed (i.e. no longer extending above the seabed). The outfall will be left in-situ, with dive teams deployed to construct a plug at the entry to the outfall, as well as works undertaken from a pontoon to construct the Active Effluent Discharge Line (AEDL) within the existing cooling water tunnel for discharges during the Proposed Works.

4.2.2 While the Proposed Works will not introduce physical obstacles to fishing, they will require temporary safety exclusion areas to be implemented for the duration of works.

4.2.3 Fishing activity is likely to be of low intensity, though it is acknowledged that the key target species (see **Section 4.1**) are of high value. However, any disruption due to a temporary exclusion zone will be of limited spatial and temporal extent and is not considered likely to result in a significant impact. Accordingly, commercial fisheries are scoped out.

4.2.4 The temporary closure of a limited area of seafront to anglers is not considered likely to have a significant impact and thus is scoped out of further assessment.

Maritime recreation

4.2.5 The Proposed Works have the potential to lead to changes at the coast and in the marine environment; these may vary spatially and temporally. Maritime recreation also has significant variety due to the range and timescales of the activities resulting from scheduled events such as seasonal competitions and more ad-hoc situations.

4.2.6 The Works Area occupies a small section of a wider area which contains maritime recreational resources distributed along natural features such as the coastline itself as well as resources concentrated at particular locations such as the yacht marina at Largs. The Site does not provide a unique resource and so the potential for the Proposed Works to lead to a significant loss of a resource is scoped out.

4.2.7 There are, however, potential interactions between maritime recreation and the Proposed Works. These interactions are expected to be mitigated via standard good practice measures, such as the presence of an exclusion zone around the Works Area, communication programmes with local ports and marine operators (including notice to mariners), measures specific to vessel movements in constrained areas (such as ports), and additional physical mitigating measures (e.g. to prevent small craft drifting onto part-finished offshore engineering works), as well as overarching project level safety measures. Therefore, the consideration of maritime recreation is scoped out from the ES.

Maritime commercial services

4.2.8 The Proposed Works have the potential to lead to changes at the coast and in the marine environment which affect maritime commercial services at a variety of distances from the Works Area and at a variety of times. The Proposed Works may purchase maritime commercial services and may also have impacts on demand and supply which affect other users.

4.2.9 The scoping of the categories is presented in **Table 4.2**. The main rationale for considering these categories is their potential for facilities or infrastructure which are within the identified Study Area of 5 km.

Table 4.2 Proposed scoping of categories identified as “productive” in Marine Scotland NMPI mapping service

#	Categories identified as ‘Productive’	Scoped-in?
1	Aquaculture	No, not in the vicinity
2	Seaweed Harvesting and Cultivation	No, not in the vicinity
3	Fishing (Commercial Sea Fishing)	No, as determined under fishing above
4	Salmon and Trout Fishing	No, not in the vicinity
5	Marine Tourism, Leisure and Recreation	No, as determined under maritime recreation above
6	Historic Environment and Cultural Heritage	No (Considered under the relevant Environmental Aspect chapter of the ES)

#	Categories identified as 'Productive'	Scoped-in?
7	Coastal Protection and Flood Defence	No (Considered under the relevant Environmental Aspect chapter of the ES).
8	Renewable Energy and Power Cables	No, not in the vicinity
9	Carbon Capture, utilisation and Storage	No, not in the vicinity
10	Oil, Gas, Pipelines and Gas Storage	No, not in the vicinity
11	Water Abstraction	No, not in the vicinity
12	Waste Disposal (Dredge Material)	No, not in the vicinity
13	Maritime transport (Ports and Shipping)	No, as marine transport requirements to deliver the Proposed Works are not considered to be substantive in magnitude
14	Waste Disposal (Waste Water Treatment and Industrial)	No, waste disposal will reduce overall as a result of the Proposed Works
15	Defence (Military)	No, there are no commercial aspects related to defence
16	Telecommunications Cables	No, not in the vicinity
17	Aggregates	No, not in the vicinity

4.3 Summary

Fishing

4.3.1 Fishing activity is likely to be of low intensity, though it is acknowledged that the key target species are of high value. However, any disruption to activity will be of limited spatial and temporal extent and thus is not considered likely to result in a significant impact and is scoped out. The temporary closure of a limited area of seafront to anglers is not considered significant and thus recreational angling is scoped out.

Maritime recreation

4.3.2 The Site is located near an area of Scotland important for the majority of the different types of maritime recreation identified in the Scottish Marine and Recreation Tourism Survey from 2016. However, the Site is not an area used exclusively for maritime recreational resources and is a very small area of a wider area used for maritime recreation and so its effects on overall supply are scoped out. While there are possibilities for interactions between maritime recreation and project activities, these are scoped out as result of measures identified in paragraph 4.2.7.

Maritime commercial services

4.3.3 The Proposed Works may purchase maritime commercial services and may interact with or have impacts on demand and supply which affect other users. The resources in the area most used commercially are related to Maritime transport (Ports and Shipping) however, the limited scale of the Proposed Works and the use of primarily land-based access, means effects related to maritime commercial services are scoped out.

5. Human health

The ONR Guidance on the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations[22] states that "*Potential impacts of a decommissioning project on health could include noise and vibration nuisance, changes in air quality, and changes to how people feel about their local community affecting their sense of wellbeing*." Potential impacts on health are therefore considered within the context of the relevant environmental aspect assessments - Noise and Vibration, Air Quality and People and Communities - rather than in a stand-alone chapter. This approach has been taken to reflect the potential human health effects as they arise across different aspects of the EIA and the development of relevant baseline information and assessment methodologies is included within these environmental aspect chapters.

5.1 Noise and vibration

5.1.1 Human health effects may result from noise and vibration during the Proposed Works on-site and from off-site traffic. **Chapter 14: Noise and Vibration** of the Scoping Report identifies effects that may occur during the Proposed Works, where noise and vibration impacts may arise from the "*demolition of buildings, dismantling of plant and construction of the Safestore".* The Preparations for Quiescence phase is anticipated to be the worst-case with respect to potential noise and vibration effects.

5.1.2 The locations closest to the Proposed Works with populations that may potentially experience human health effects from noise and vibration are identified 0.45 km to the east of the Site (See **Table 14.8** in **Chapter 14: Noise and Vibration** of the Scoping Report). The chapter also identifies the populations that may potentially experience effects of road traffic noise as Noise Sensitive Receptors (NSRs), within specific distances of the road transport routes used and will therefore be taken forward for assessment. A number of mitigation measures are proposed to reduce noise, vibration and associated health effects. These are identified in **Chapter 14: Noise and Vibration** of the Scoping Report as follows:

- *"Proposed Works activities will be undertaken during normal construction hours (07:00 to 19:00 hours, Monday to Friday), except in cases of emergencies or works that need to be undertaken continuously. Noise and vibration emissions during the Proposed Works will be subject to control through best practice measures, and any additional measures required, that will be set out in an Environmental Management Plan (EMP)."*

[22] ONR (2023). Guidance on the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations.

5.1.3 Human health effects may result from excessive noise and vibration. **Chapter 14: Noise and Vibration** of the Scoping Report reflects all relevant guidance, including revised DMRB (LA 111), against which vibration from demolition and construction activities associated with the Proposed Works and from off-site vehicle movements are scoped out. Human health effects from noise from demolition and construction activities and from road traffic are scoped in.

5.2 Air quality

5.2.1 Human health effects may arise from air quality impacts associated with the Proposed Works. **Chapter 5: Air Quality** of the Scoping Report identifies "*construction, demolition, earthworks and trackout activities"* on-site, as a potential source of air quality impacts with related effects on human health arising from fugitive dust emissions. In addition, combustion product emissions associated with "*On-road HGVs and LDV movements for construction and demolition activities"* may have potential effects on human health from increases in concentrations of pollutants.

5.2.2 Human health effects arising from air quality impacts may occur during the initial and final phases of development (Preparations for Quiescence phase and Final Site Clearance phase) (see **Chapter 2: The Decommissioning Process** of the Scoping Report). No activities which give rise to air quality impacts are planned within the intervening Quiescence phase, such as from construction, demolition, earthworks or trackout activities or from vehicle movements.

5.2.3 The proposed assessment methodology **Chapter 5: Air Quality** of the Scoping Report follows the Institute of Air Quality Management (IAQM) guidance[23] [24]. The locations closest to the Proposed Works with populations that may potentially experience human health effects from fugitive dust emissions are identified 0.45 km to the east of the Site (**Table 5.14** in **Chapter 5: Air Quality**). Air quality assessment of the human health effects of road traffic emissions will be considered in the ES, following screening criteria defined in guidance by Environmental Protection Scotland[25].

5.2.4 During the assessment, mitigation of effects on human health arising from air quality impacts generated by the Proposed Works will be identified and applied. For example, mitigations contained within a Dust Management Plan.

5.3 People and communities

5.3.1 Human health is affected by the changes resulting from the Proposed Works and the wider socio-economic determinants characteristic of the community. The main socio-economic effect identified in **Chapter 16: Socio-economics** of the Scoping Report is the potential change in employment. Employment is a socio-economic determinant with established links to levels of health with the UK government stating

[23] IAQM (2014). IAQM Guidance on the assessment of dust from demolition and construction (Online). Available at: http://iaqm.co.uk/wp-content/uploads/guidance/iaqm_guidance_report_draft1.4.pdf

[24] IAQM. (2018). Guidance on Monitoring in the Vicinity of Demolition and Construction Sites, Version 1.1. (Online). Available at: http://iaqm.co.uk/text/guidance/guidance_monitoring_dust_2018.pdf

[25] Environmental Protection Scotland and RTPI Scotland (2017). Delivering Cleaner Air for Scotland: Development Planning & Development Management. (Online). Available at: https://www.ep-scotland.org.uk/wp-content/uploads/2015/04/DeliveringCleanerAirForScotland-18012017.pdf

that "*there is clear evidence that good work improves health and wellbeing across people's lives*" [26].

5.3.2 The assessment of effects on human health in the People and Communities chapter is based on the changes arising from the levels of employment required for the Proposed Works and the associated impacts which may lead to health effects.

5.4 Summary

5.4.1 Human health effects are scoped into the assessment within the relevant environmental aspect chapters and therefore the associated baseline, assessment of potentially significant effects and development of mitigation measures will be considered in the ES.

6. Transboundary effects

6.1.1 Preliminary work undertaken across the environmental aspects to prepare the HNB Scoping Report concluded that no transboundary effects are anticipated to arise as a result of the Proposed Works. This was based on a detailed review of the planned activities within each phase of the Proposed Works within the Works Area, as well as the Study Areas / zones of influence associated with each relevant environmental aspect and the relevant key receptors. **Table 6.1** presents the maximum extent of the relevant Study Area for each environmental aspect assessment in the ES which provides justification for why transboundary effects are scoped out for all environmental aspects.

Table 6.1 Environmental aspect Study Areas

Environmental Aspect	Study Area
Air Quality	The largest Study Area associated with the air quality assessment, extends to 250 m from the boundary of the Proposed Works and 50 m from the route(s) used by mobile machinery.
Terrestrial Biodiversity and Ornithology	The maximum extent of the Study Area associated with the terrestrial biodiversity and ornithology assessment is 200 km for Sites that are of International Importance for the conservation of highly mobile seabirds. However, these sites are designated for species that primarily forage in the wider offshore environment, beyond the marine elements of HNB's infrastructure and these European Sites are therefore also scoped-out of the assessment.

[26] UK Government (2023). Health matters: health and work. (Online). Available at: https://www.gov.uk/government/publications/health-matters-health-and-work/health-matters-health-and-work

Environmental Aspect	Study Area
Marine Biodiversity	The largest Study Area associated with the marine biodiversity assessment is 200 km for migratory fish and cetaceans. However, as the effects of Proposed Works in the marine environment are described as localised and temporary, the assessment concludes that there are no significant effects.
Climate Change	The spatial scope for the GHG emissions assessment was informed by the spatial extent of the Proposed Works, including all activities within the Site during its decommissioning, as well as the GHG emissions associated with transport movements to and from the Proposed Works.
Historic Environment	The primary Study Area for the historic environment assessment includes a buffer distance of 5 km from the Works Area for designated assets, with a smaller Study Area of 500 m for non-designated assets.
LVIA	The LVIA Study Area includes receptors within 3 km of the Works Area.
Noise and Vibration	The largest Study Area associated with the assessment presented in the noise chapter is approximately 2 km distance from the Works Area.
People and Communities	The Study Area is limited to Scotland, at its greatest extent.
Soils, Geology and Hydrogeology	The Study Area includes the Works Area + a 250 m buffer.
Traffic and Transport	The Study Area is limited to specific roads on Scotland's road network.
Coastal Management and Water Quality	The Study Area includes the tidal ellipse which extends over a distance of 4 km to the north-north-east and south-south-west in each direction from the Site.
Conventional Waste	The Study Area includes the administrative area of North Ayrshire Council (NAC) which is the appropriate Waste Planning Authority (WPA).
Major Accidents and Disasters	The largest Study Area extends to 20 km from the Site and includes the nearest airport.
Radiological Effects	Scoped out on the basis radiological effects are subject to other regulatory processes and legislation, including The Transboundary Radioactive Contamination (Scotland) Direction 2021.

7. Summary

7.1.1 The summary of the requirements for further assessment in relation to those topics identified in HNB Pre-application Opinion responses are presented in **Table 7.1.**

Table 7.1 summary of the requirements for further assessment in relation to those topics identified in HNB Pre-application Opinion responses

Topic	Scoped in / out for further assessment
Marine archaeology	Scoped out of further assessment
Material resource use	Scoped in for further assessment
Fishing (commercial fisheries)	Commercial fisheries - Scoped out for further assessment Recreational angling - Scoped out for further assessment
Maritime recreation	Scoped out on the basis that measures are in place for the Proposed Works to prevent effects on maritime recreation users.
Maritime commercial services	Scoped out, due to the limited scale of the Proposed Works and the use of primarily land-based access.
Human health	Scoped in for further assessment within the noise, air quality and people and communities chapters of the ES.
Transboundary effects	Scoped out for further assessment

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Management systems

This document has been produced in full compliance with our management systems, which have been certified to ISO 9001, ISO 14001 and ISO 45001 by Lloyd's Register.

Document revisions

No.	Details	Date
1	Issue	October 2023

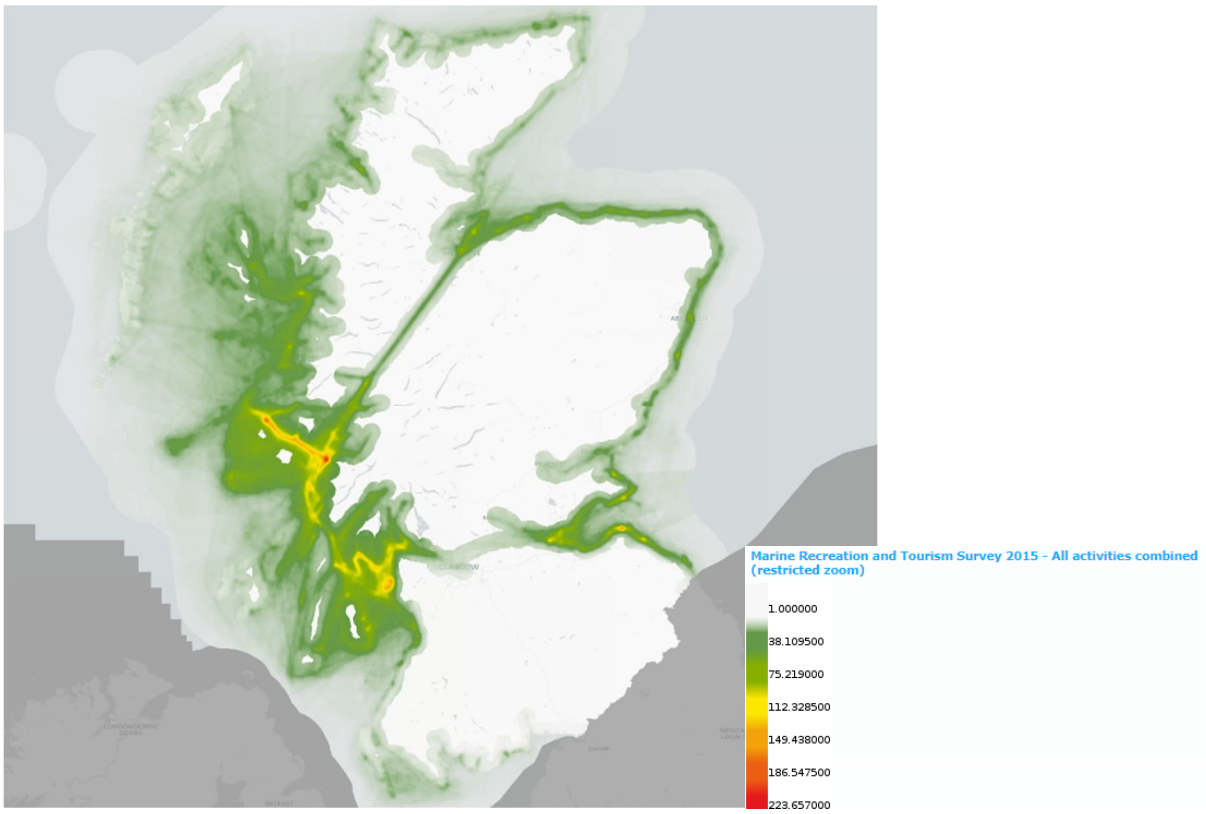
Appendix A

APPENDIX A – SUPPORTING GRAPHICS

The following figures are generated using The National Marine Plan Interactive (NMPI) service from Marine Scotland on the 26th March 2023. The mapping uses data from the Scottish Marine and Recreation Tourism Survey (Scottish Government, 2016) [mapping available at https://marinescotland.atkinsgeospatial.com/nmpi/default.aspx?layers=1041]

A figure is presented for each activity, numbered #1 to #24 but excluding #10 ("Other unclassified activities") as being overly non-specific.

Graphic A4.1 - Heat map showing intensity of use of sea areas for marine recreational activities in Scotland[1]

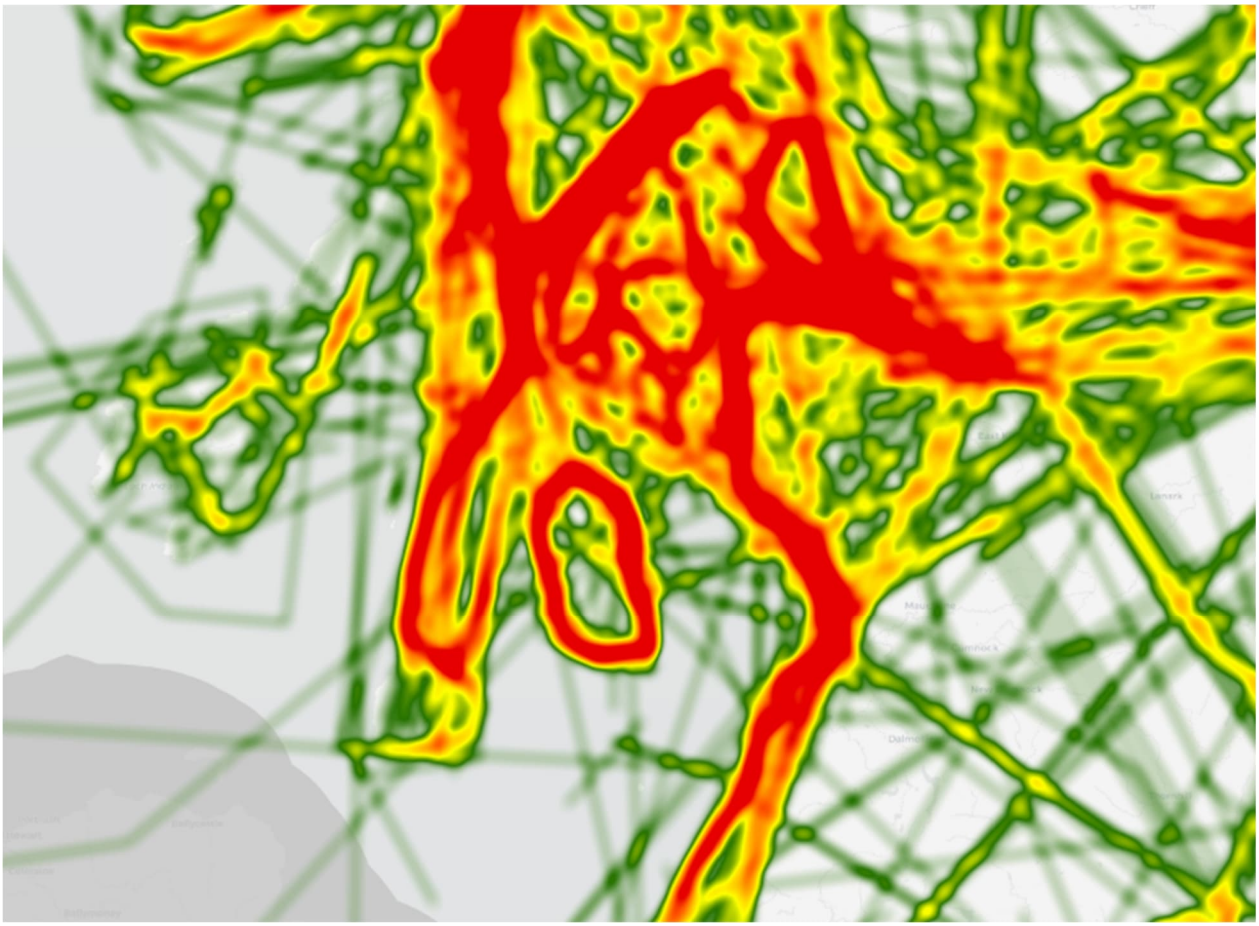


[1] Source: Scottish Marine and Recreation Tourism Survey (Scottish Government, 2016) [mapping available at https://marinescotland.atkinsgeospatial.com/nmpi/default.aspx?layers=1041]

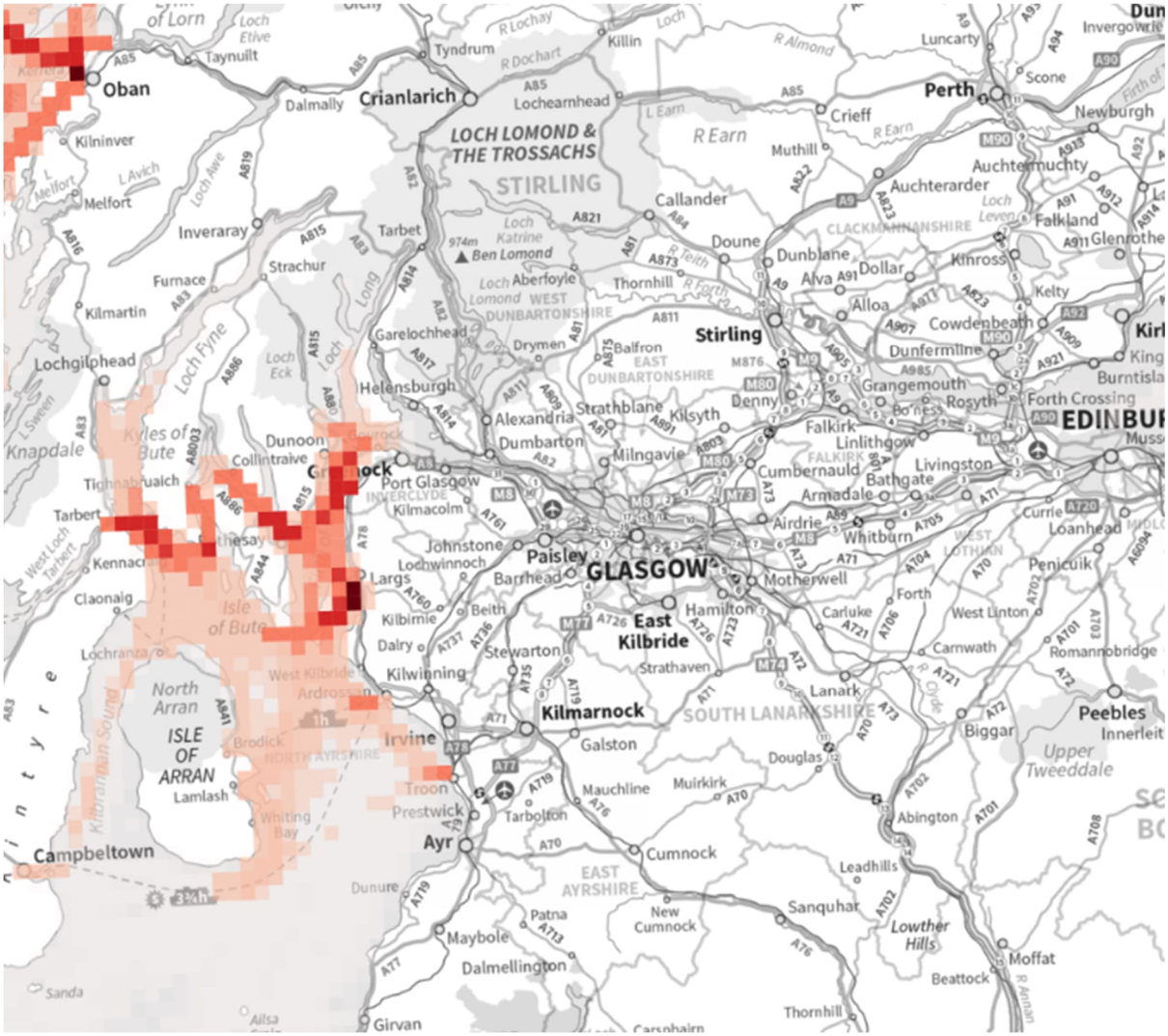
Table A4.1 – Types of marine recreational activities identified in Scotland

#	Type of marine recreational activity
1	Birds and wildlife watching
2	Canoeing or kayaking in the sea
3	Coastal climbing, bouldering and coasteering
4	Dinghy racing at sea
5	General marine and coastal recreation
6	General marine and coastal tourism
7	Land yachting, power kiting and kite buggying at the coast
8	Long-distance swimming in the sea
9	Motor cruising at sea
10	Other unclassified activities
11	Personal watercraft (jet skis) at sea
12	Power boating at sea
13	Rowing and sculling in the sea
14	Sailing and cruising at sea including dinghies
15	SCUBA diving in the sea
16	Sea angling from a private or chartered boat
17	Sea angling from shore
18	Surfing, surf kayaking or paddleboarding in the sea
19	Visits to historic sites and attractions
20	Walking at the coast
21	Water-skiing and wakeboarding in the sea
22	Wildfowling
23	Windsurf and kite surfing at the coast
24	Yacht racing at sea

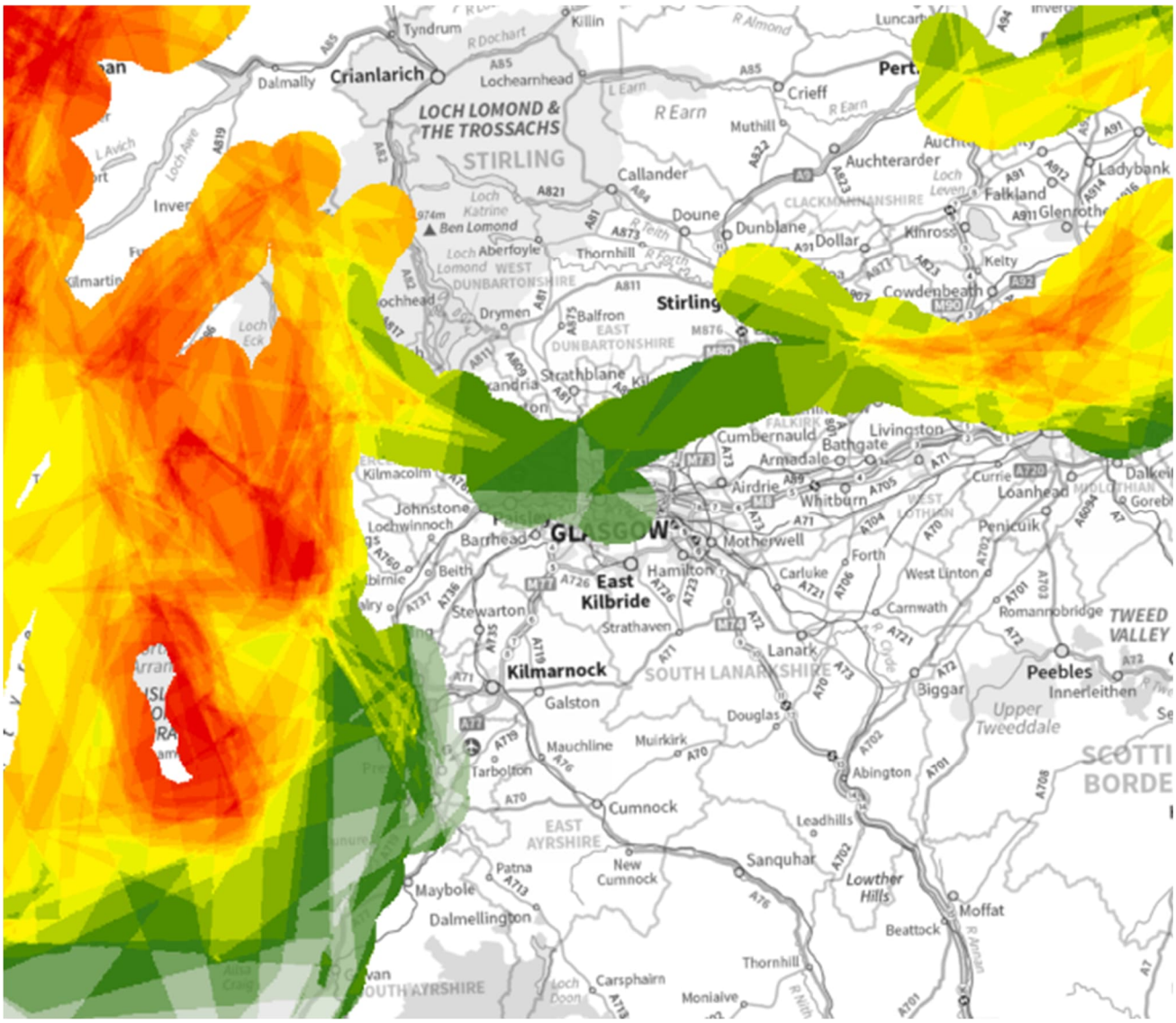
Graphic A4.2 - Heat map showing intensity of marine recreational activities near the Isle of Arran (combined activities)



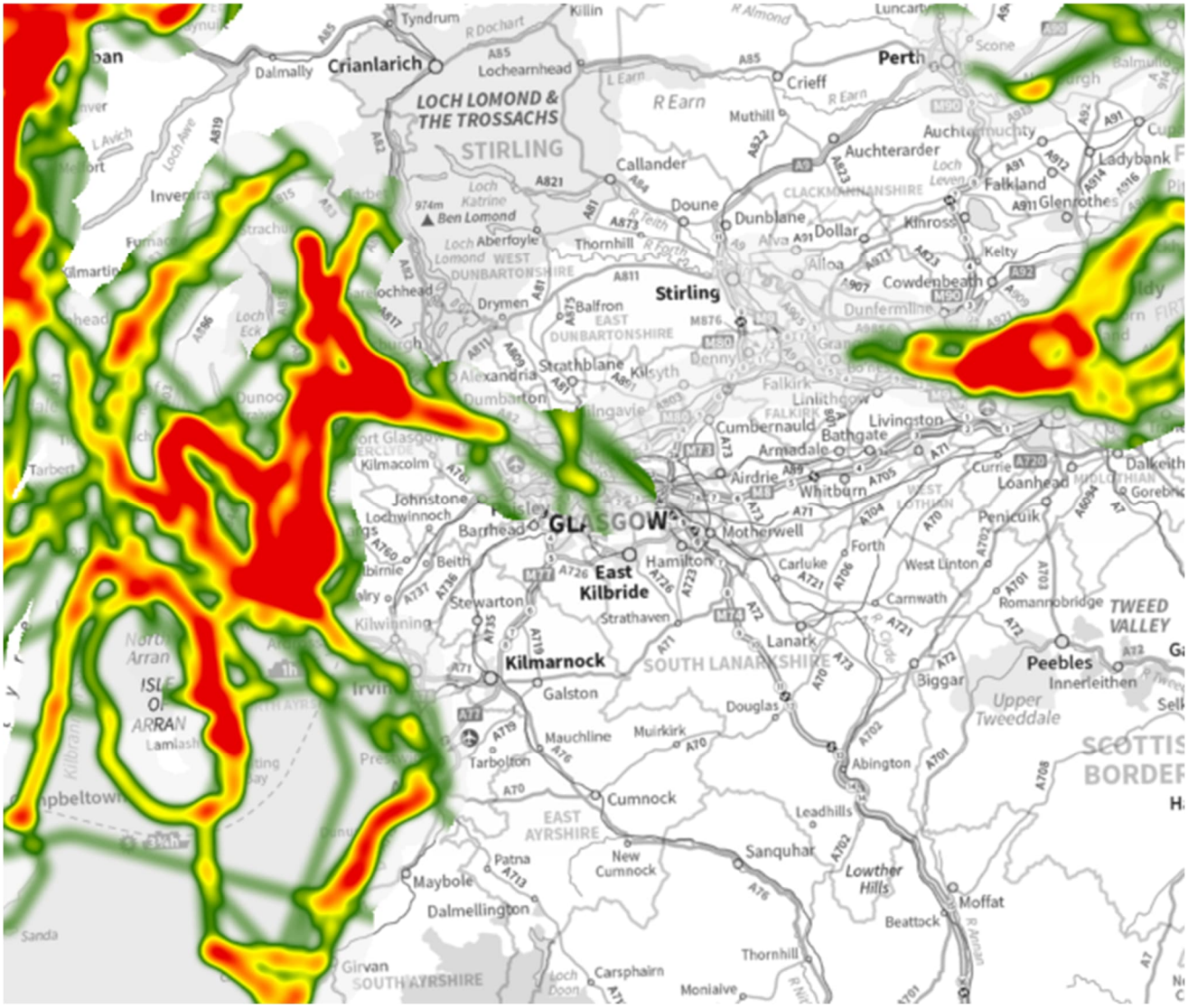
Graphic A4.3 - Heat map showing AIS shipping traffic - average weekly density of recreational vessels 2012 - 2017 (time aware) Source: Marine Scotland - National Marine Plan Interactive https://marinescotland.atkinsgeospatial.com/nmpi/default.aspx?layers=1041



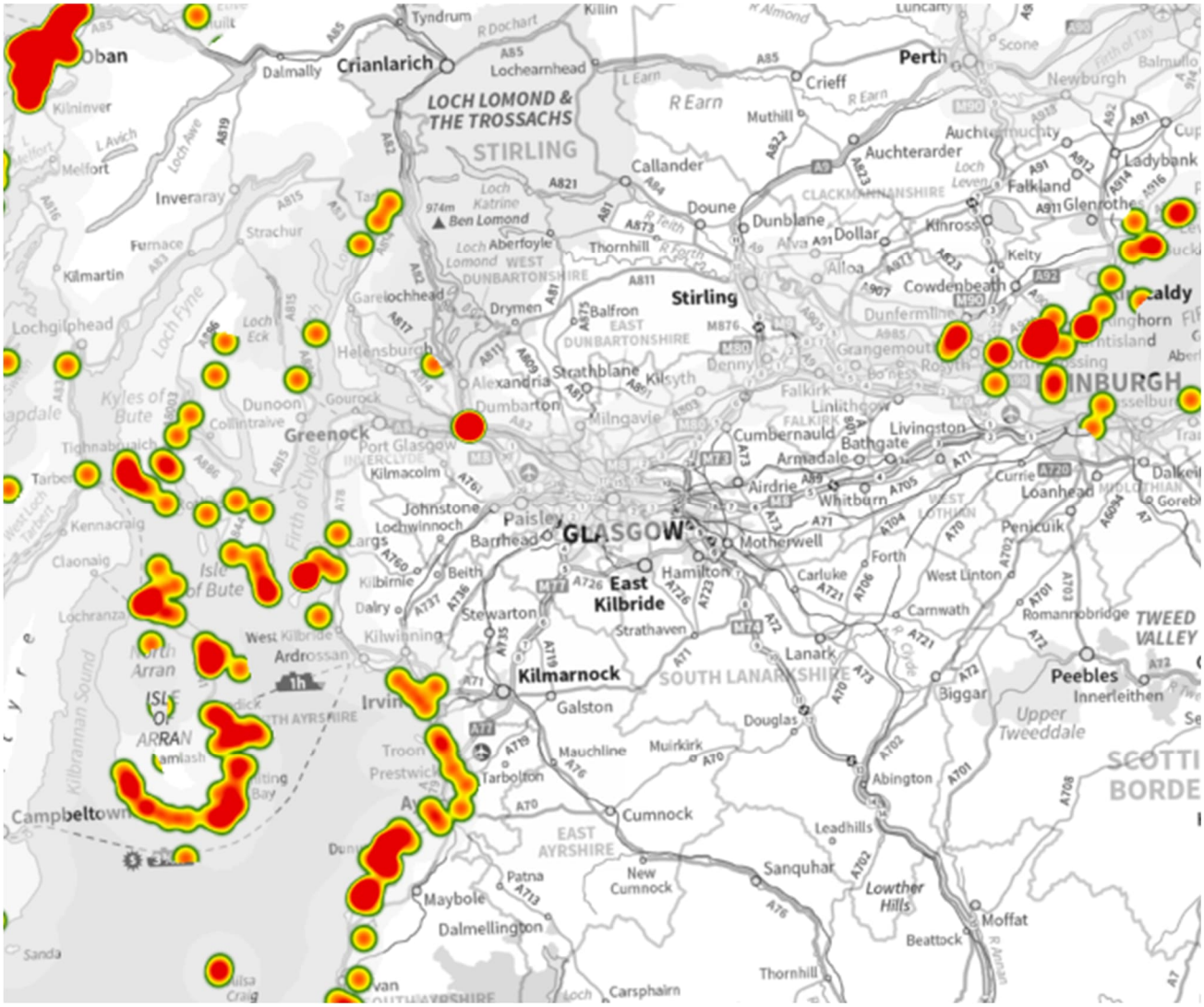
Graphic A4.4 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #1 “Birds and wildlife watching”)



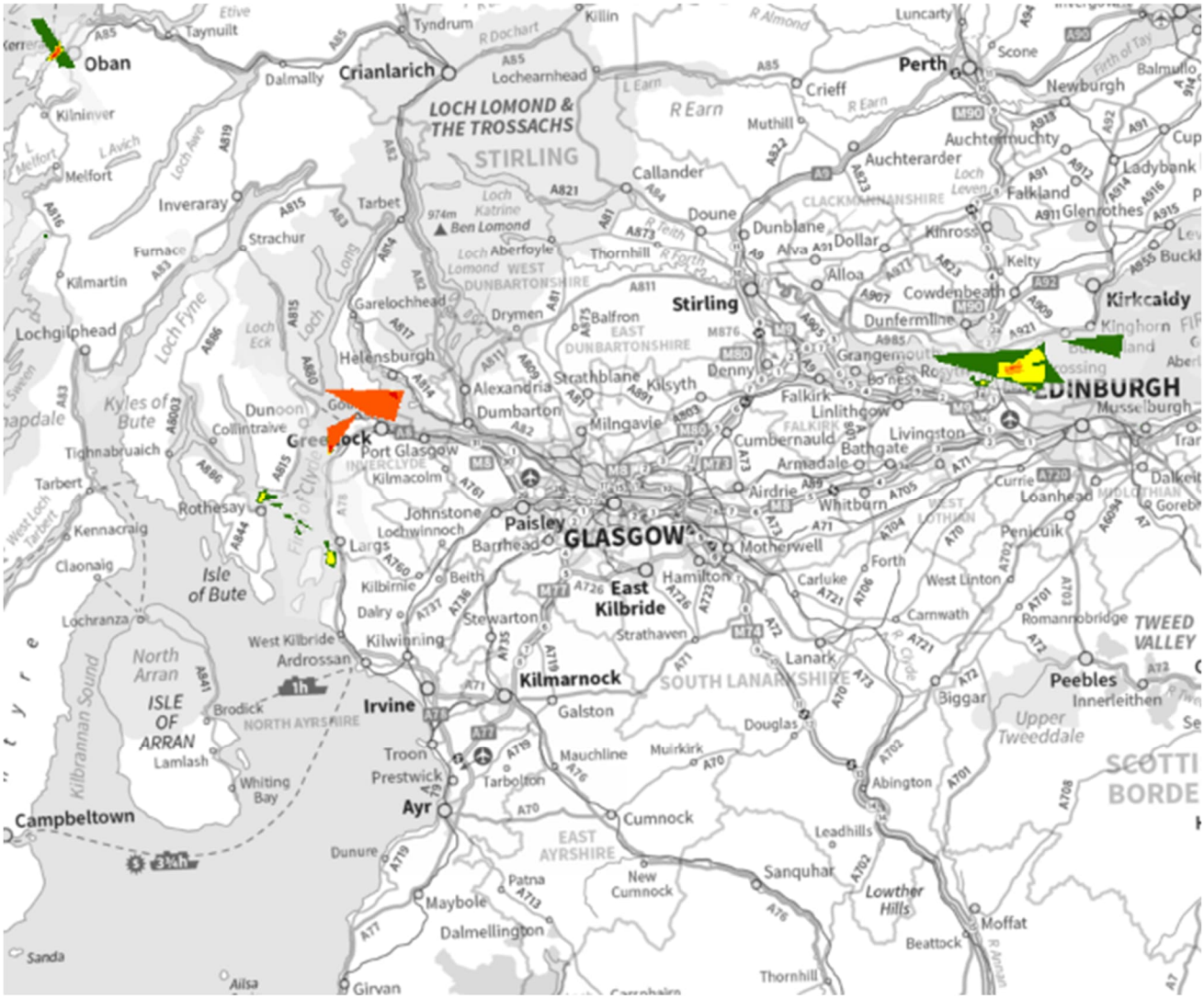
Graphic A4.5 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #2 “Canoeing or kayaking in the sea”)



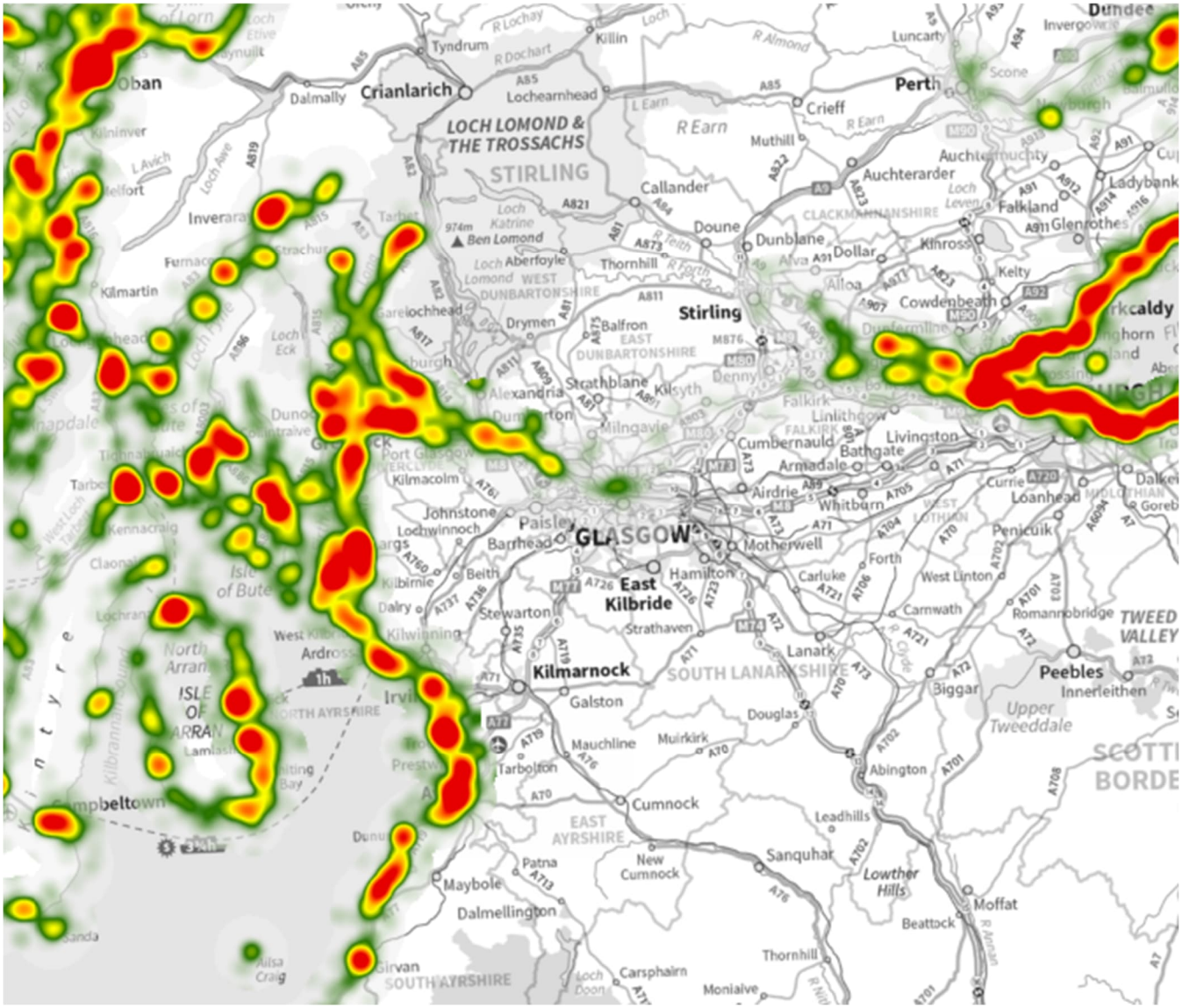
Graphic A4.6 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #3 “Coastal climbing, bouldering and coasteering”)



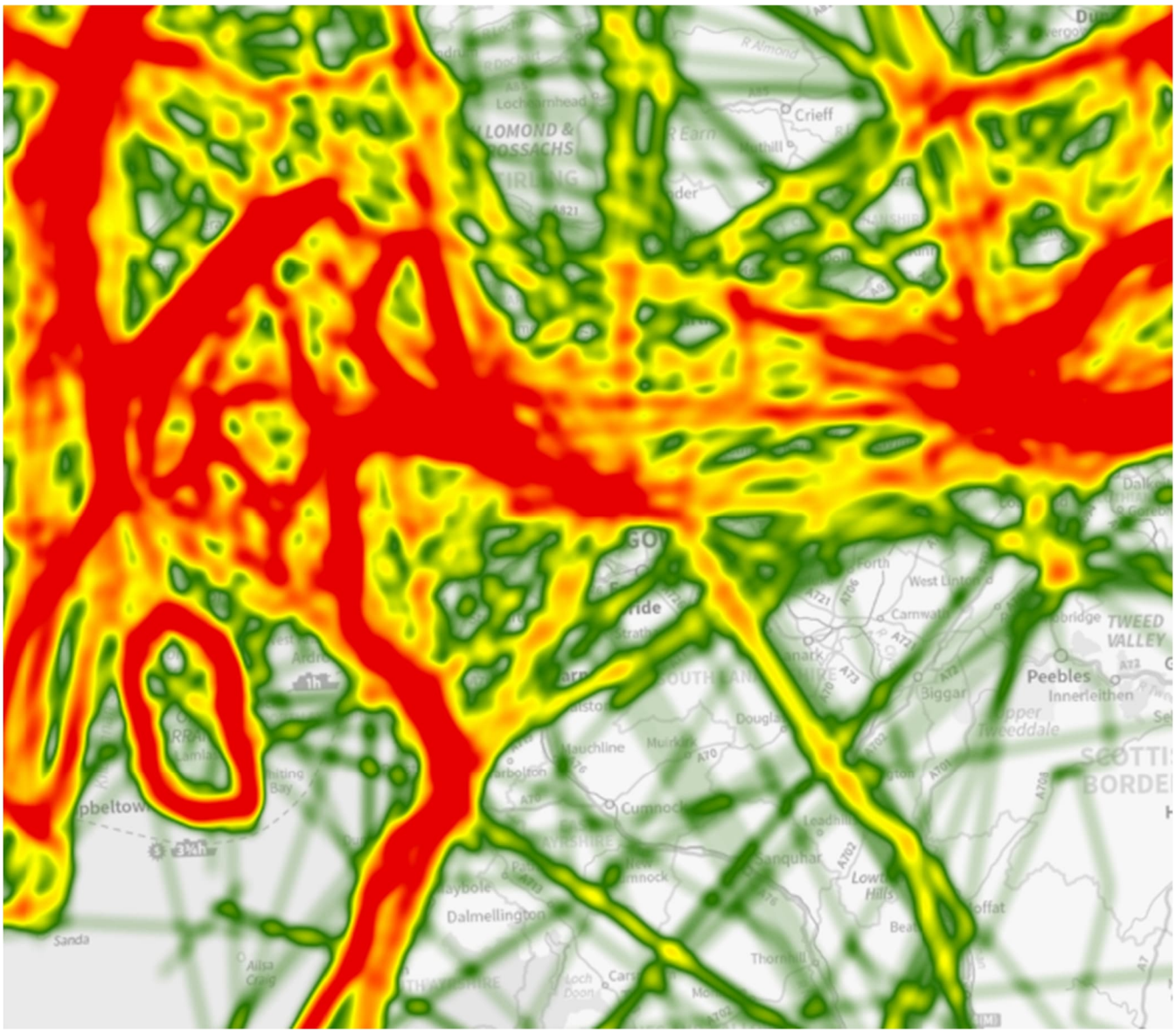
Graphic A4.7 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #4 “Dinghy racing at sea



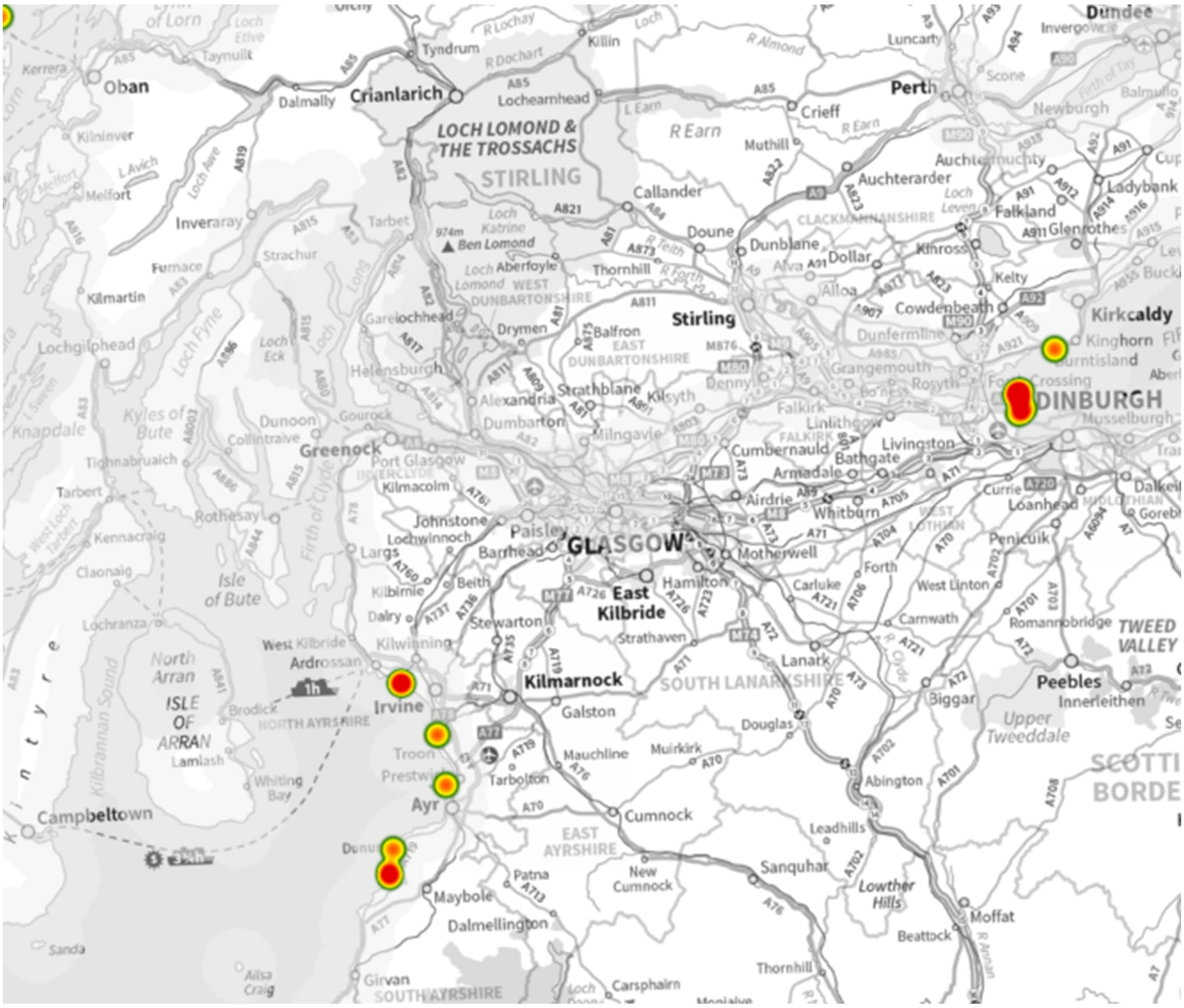
Graphic A4.8 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #5 “General marine and coastal recreation”)



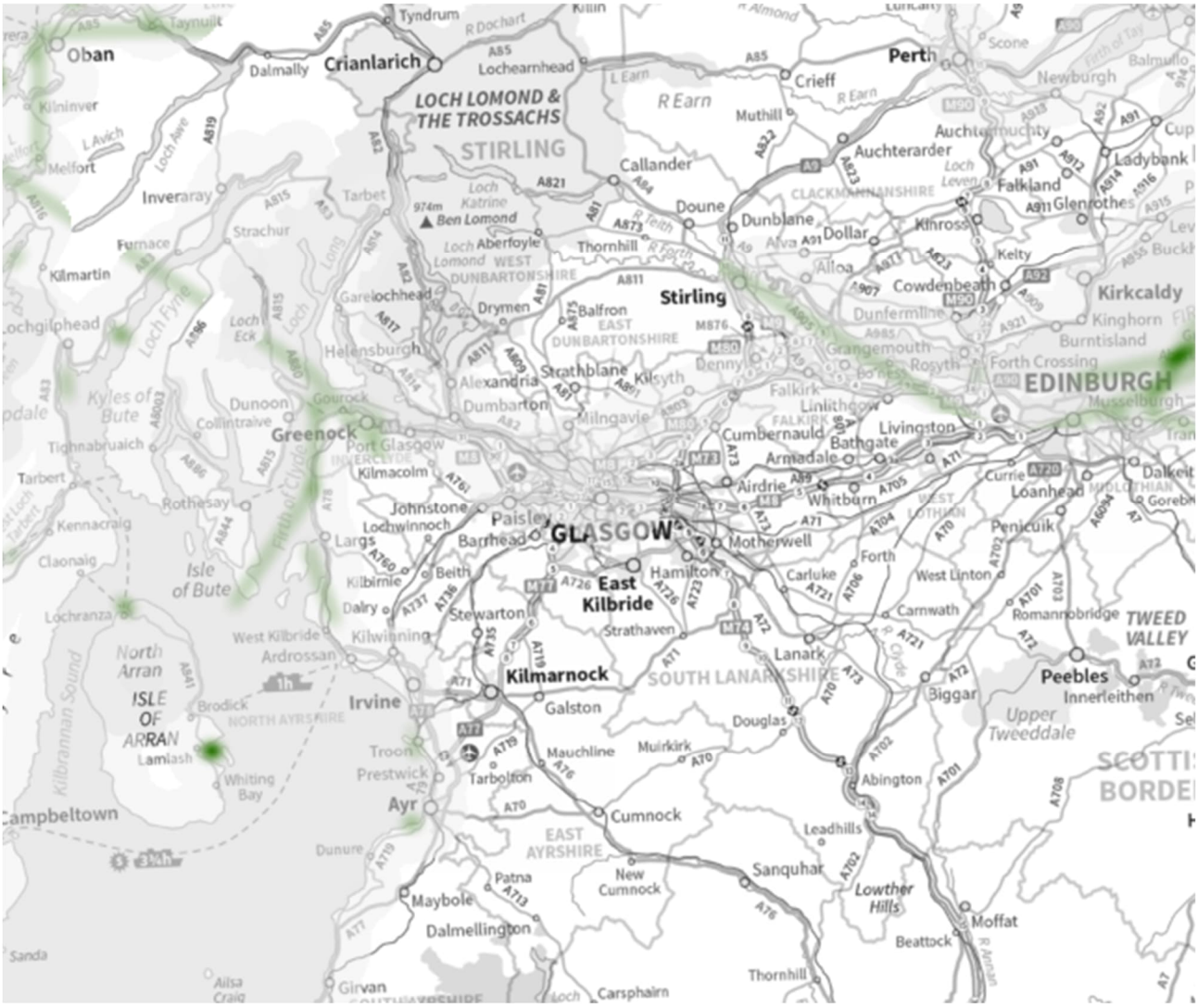
Graphic A4.9 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #6 “General marine and coastal tourism”)



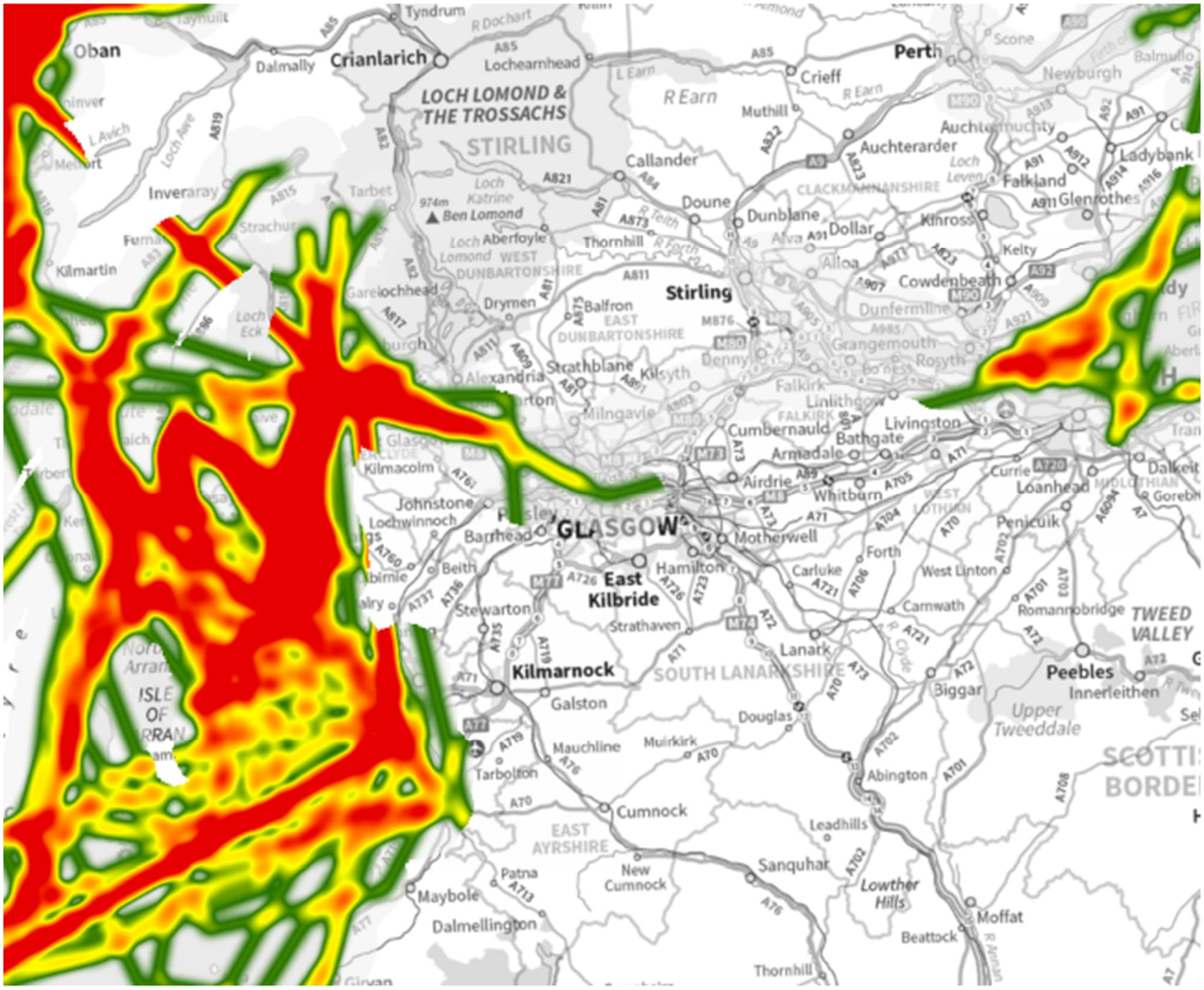
Graphic A4.10 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #7 "Land yachting, power kiting and kite buggying at the coast")



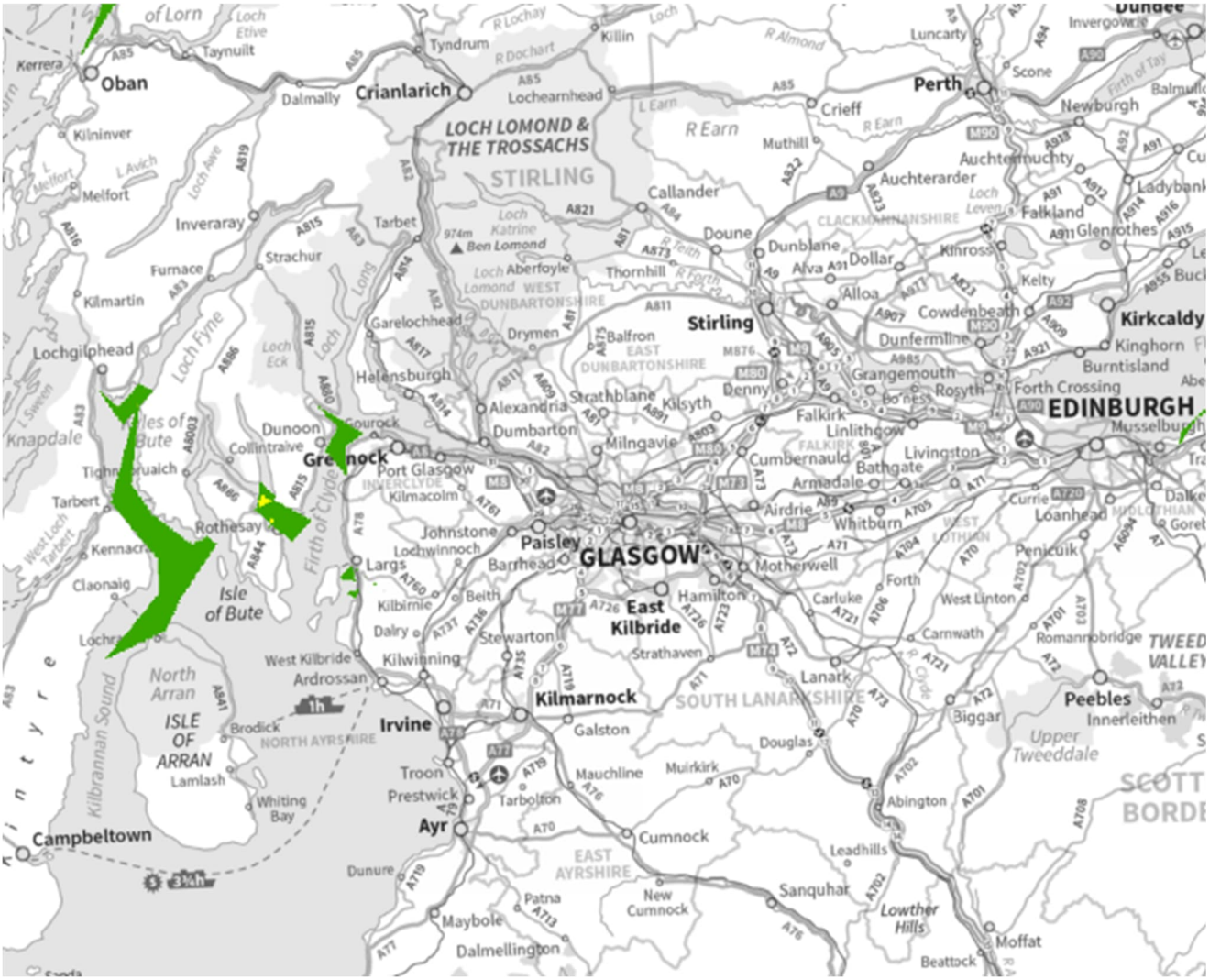
Graphic A4.11 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #8 “Long-distance swimming in the sea”)



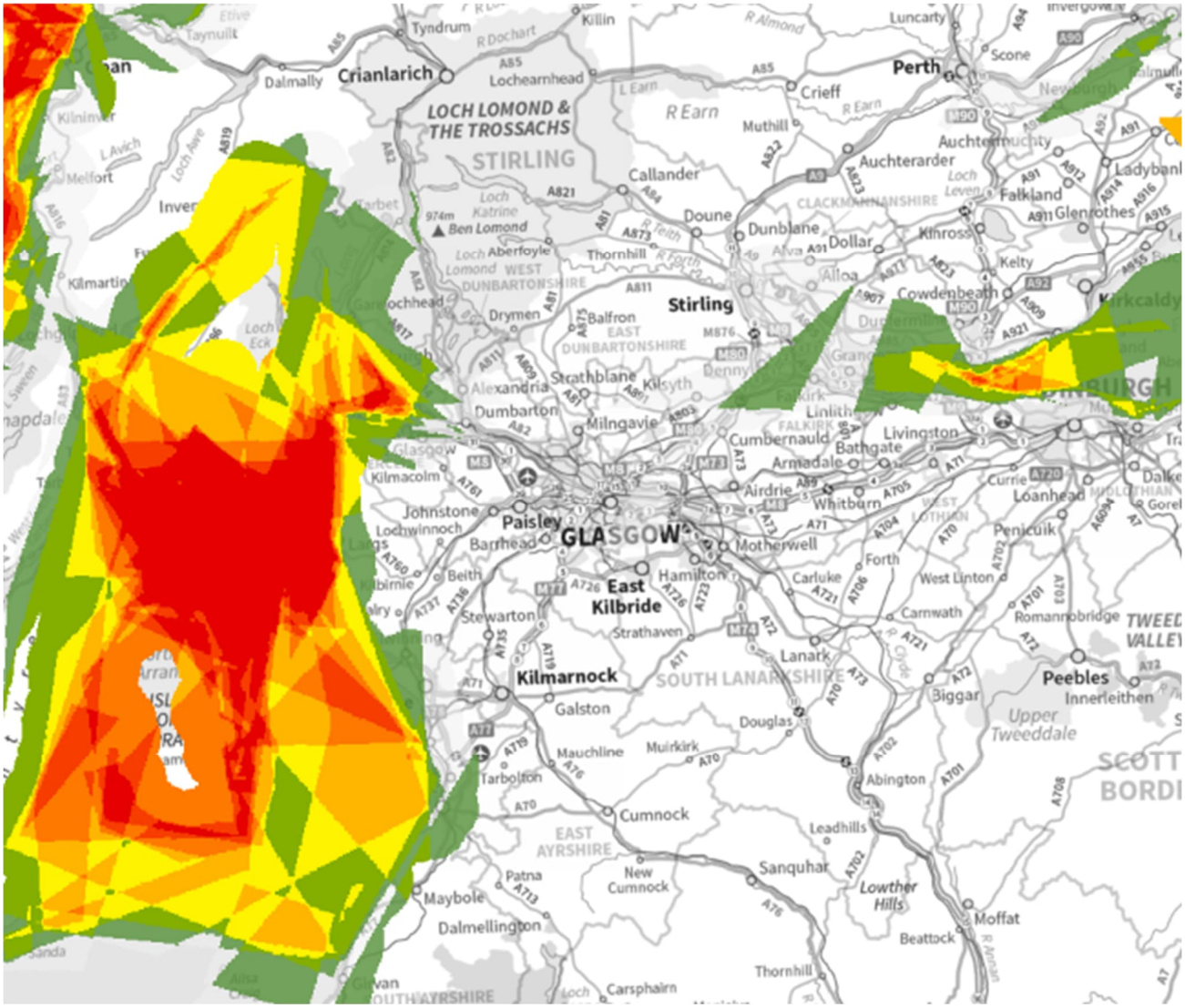
Graphic A4.12 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #9 “Motor cruising at sea”)



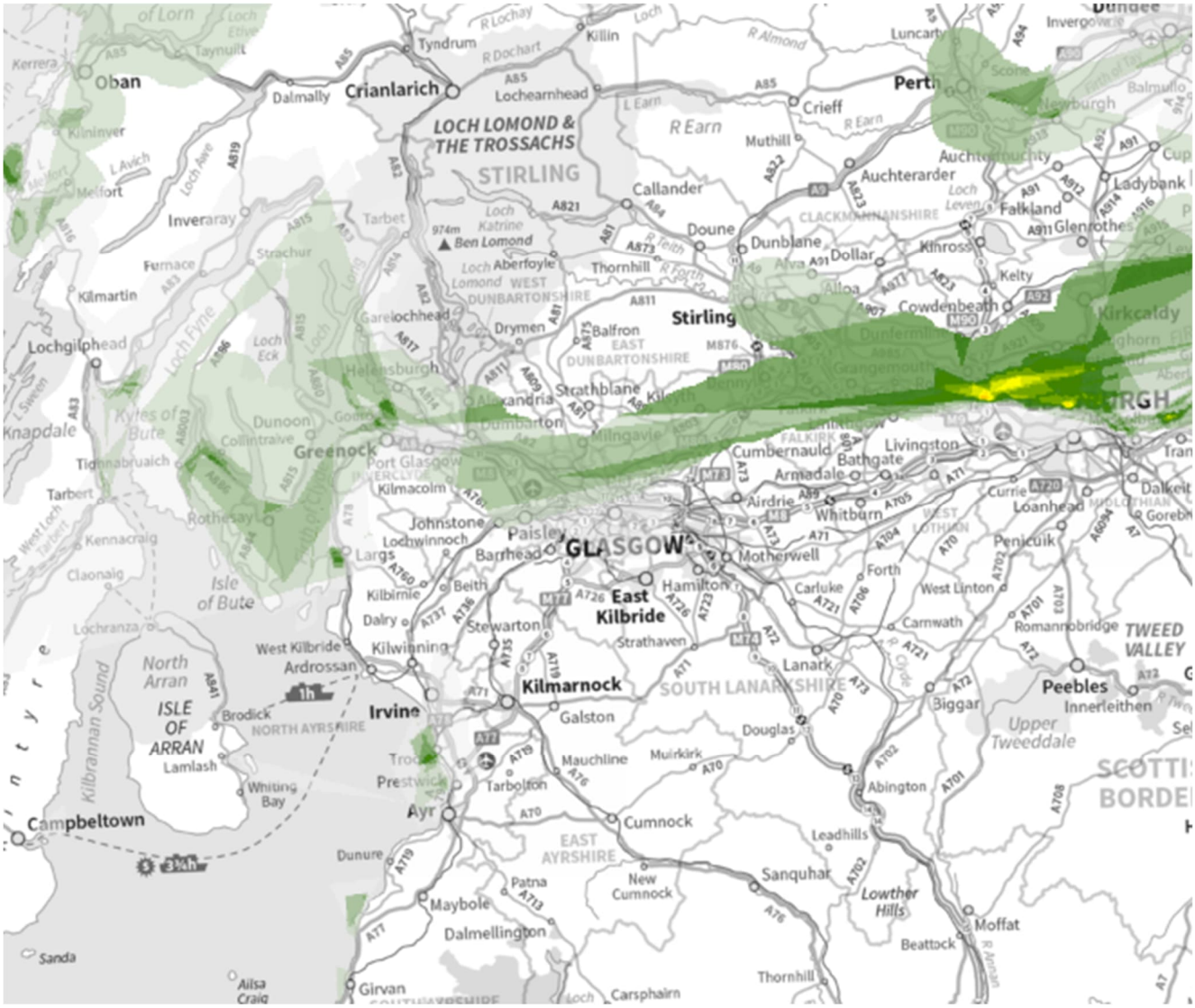
Graphic A4.13 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #11 “Personal watercraft (jet skis) at sea”)



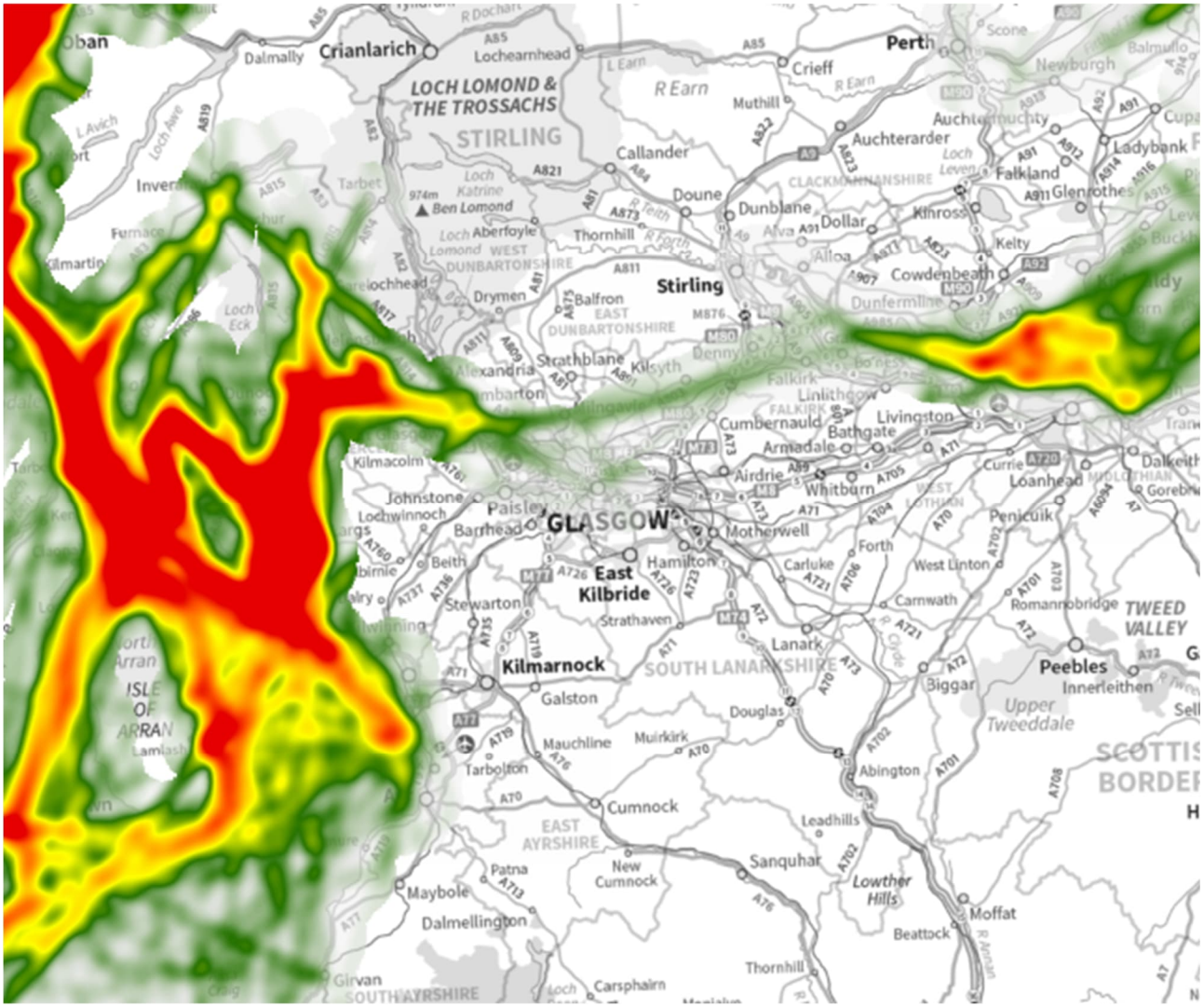
Graphic A4.14 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #12 “Power boating at sea



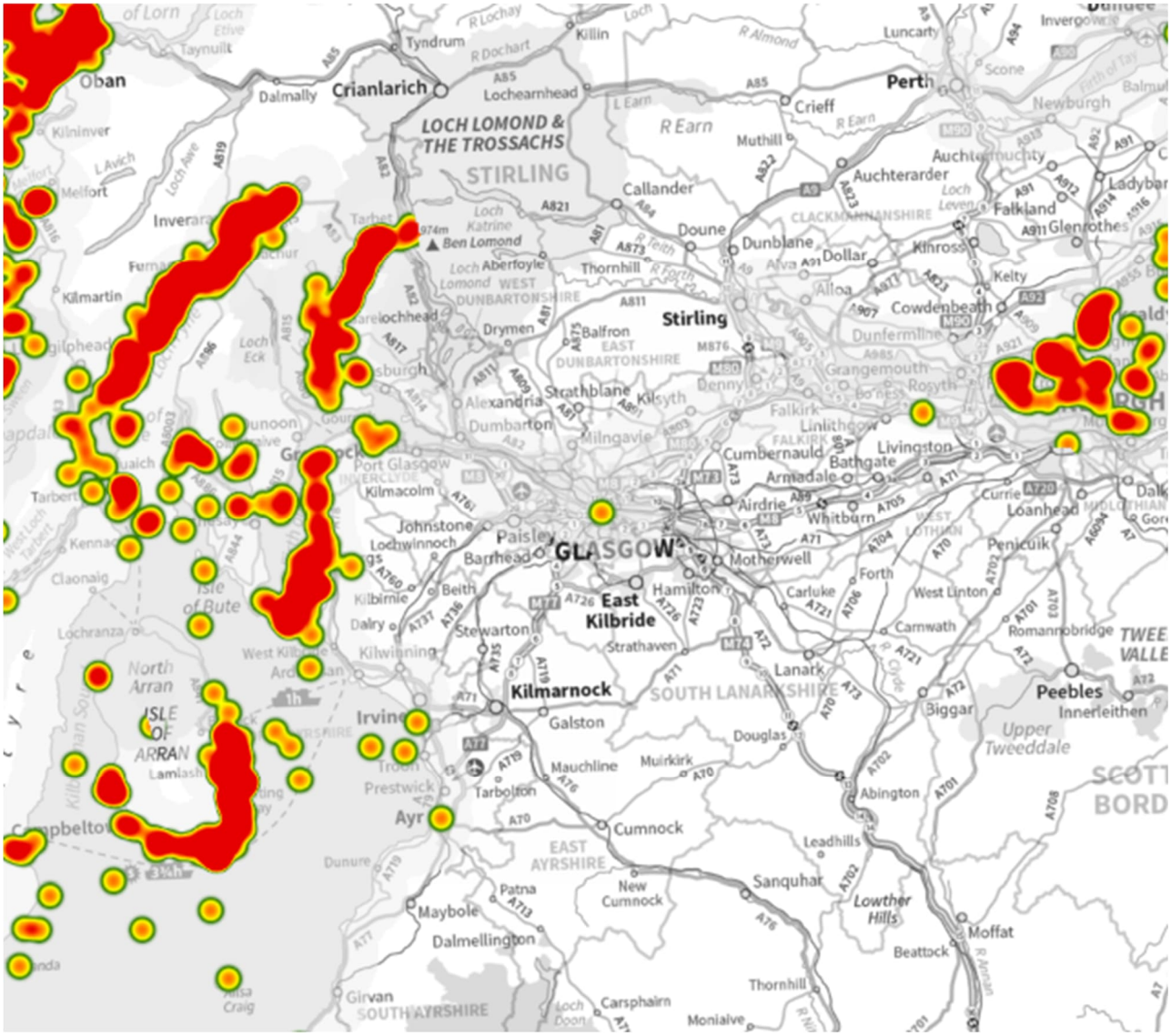
Graphic A4.15 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #13 “Rowing and sculling in the sea”)



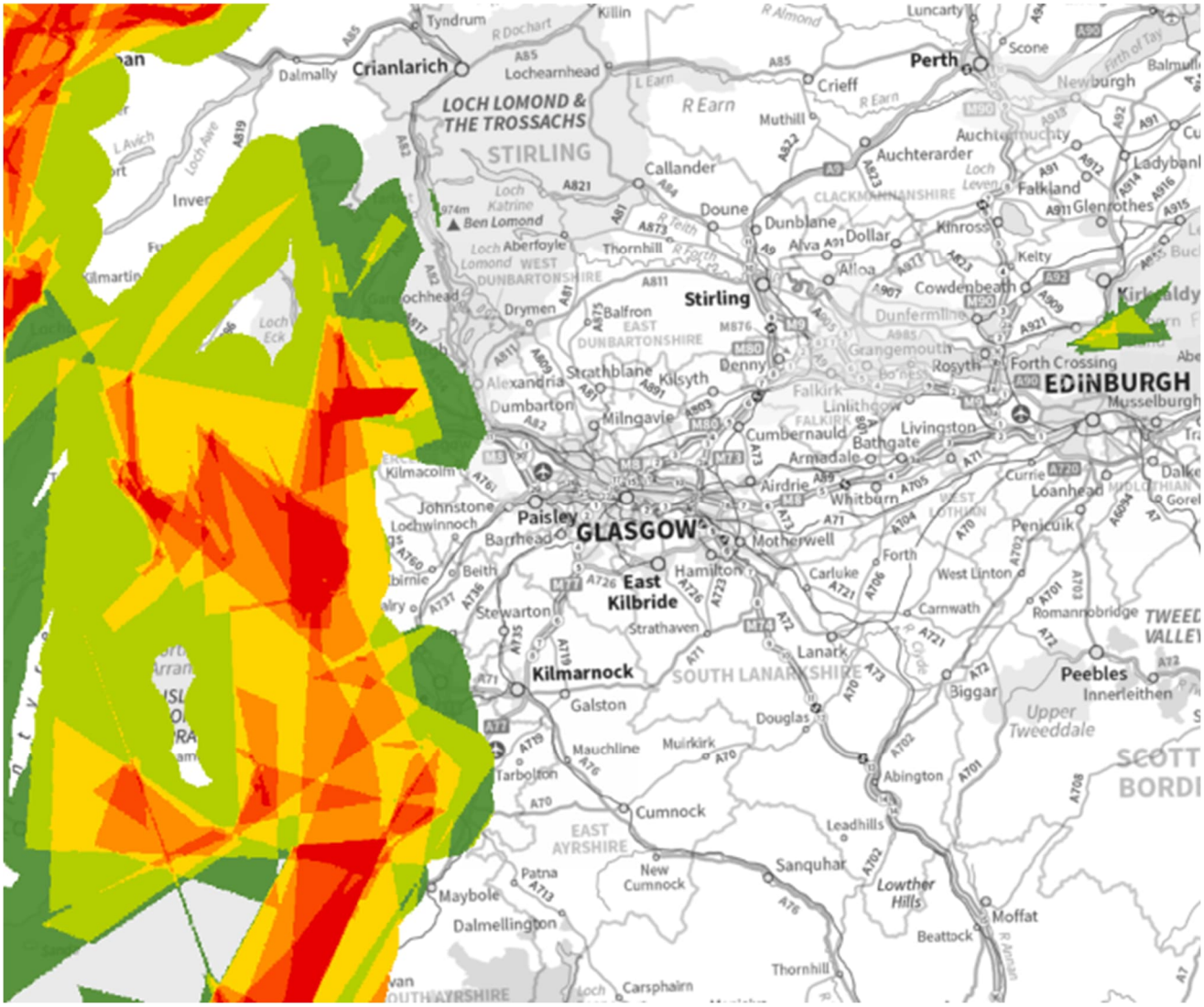
Graphic A4.16 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #14 “Sailing and cruising at sea including dinghies”)



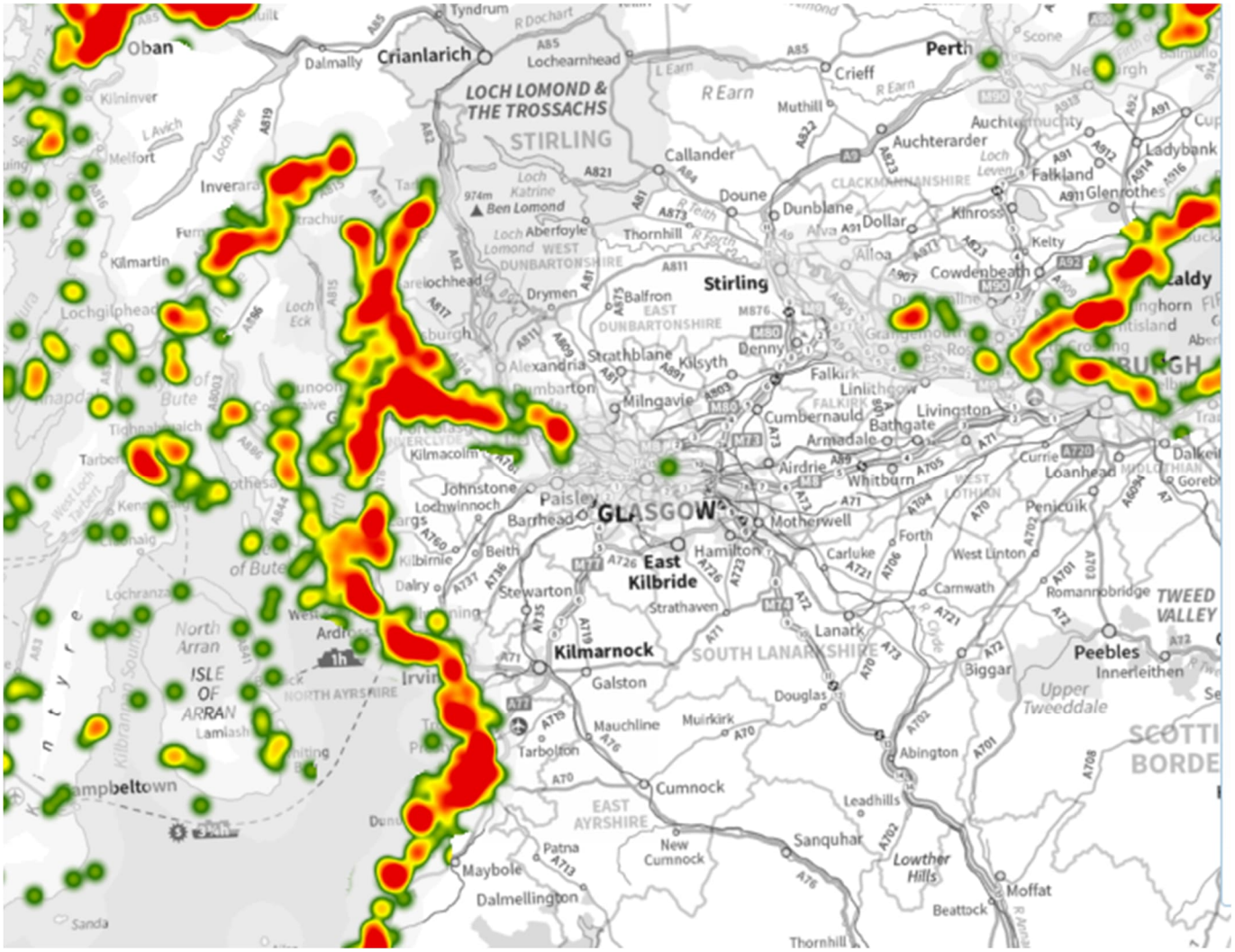
Graphic A4.17 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #15 “SCUBA diving in the sea”)



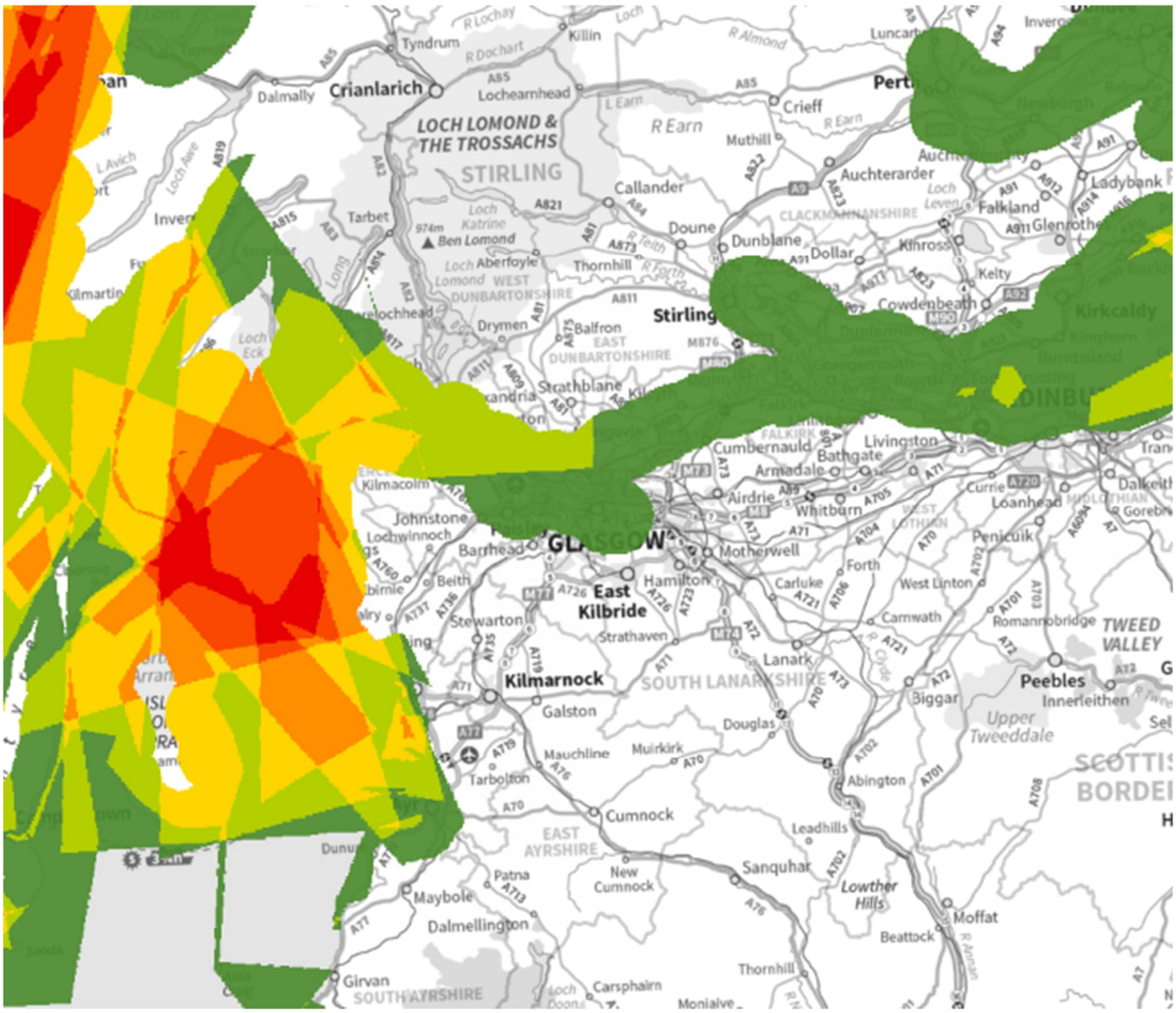
Graphic A4.18 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #16 “Sea angling from a private or chartered boat”)



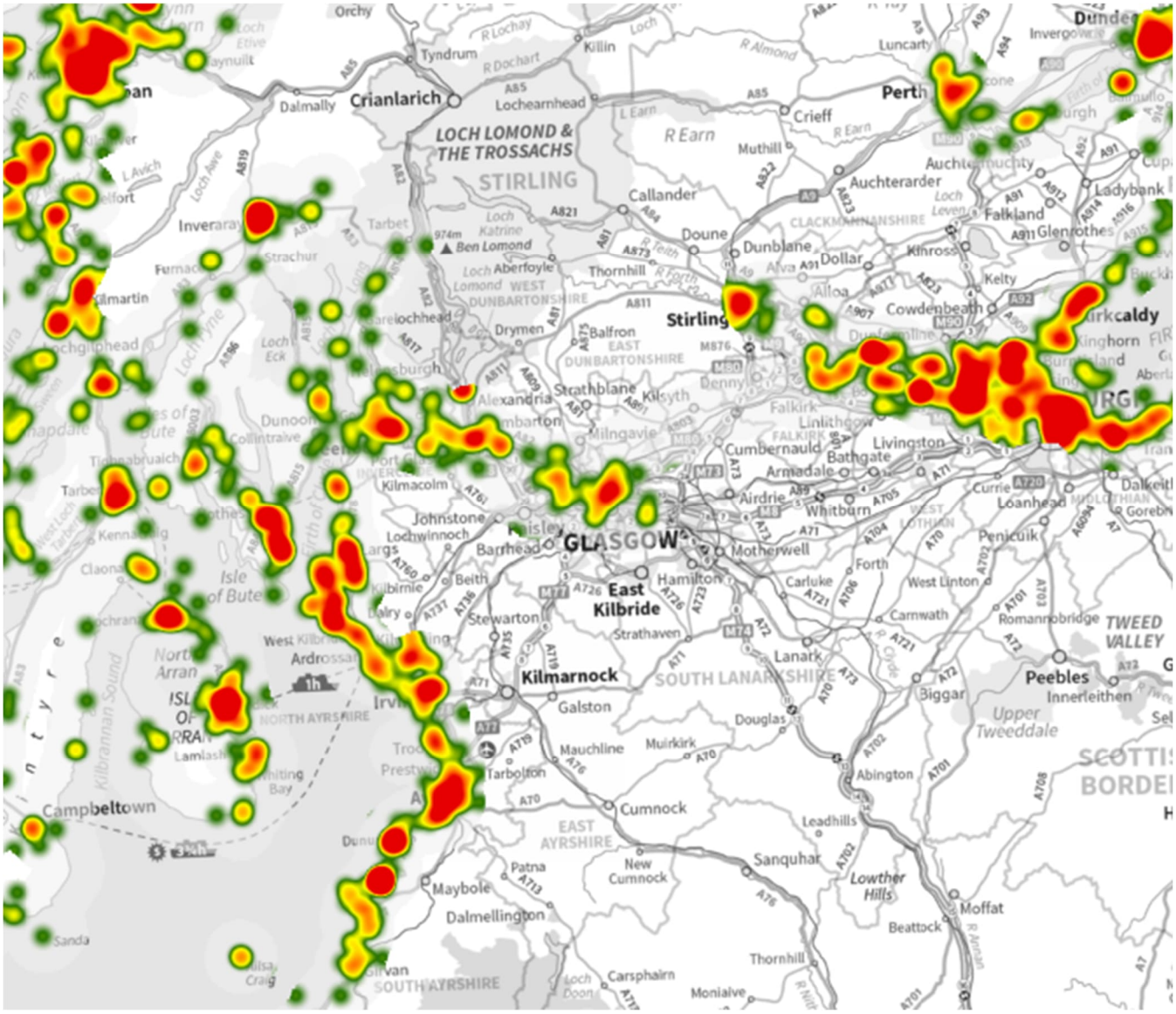
Graphic A4.19 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #17 “Sea angling from shore”)



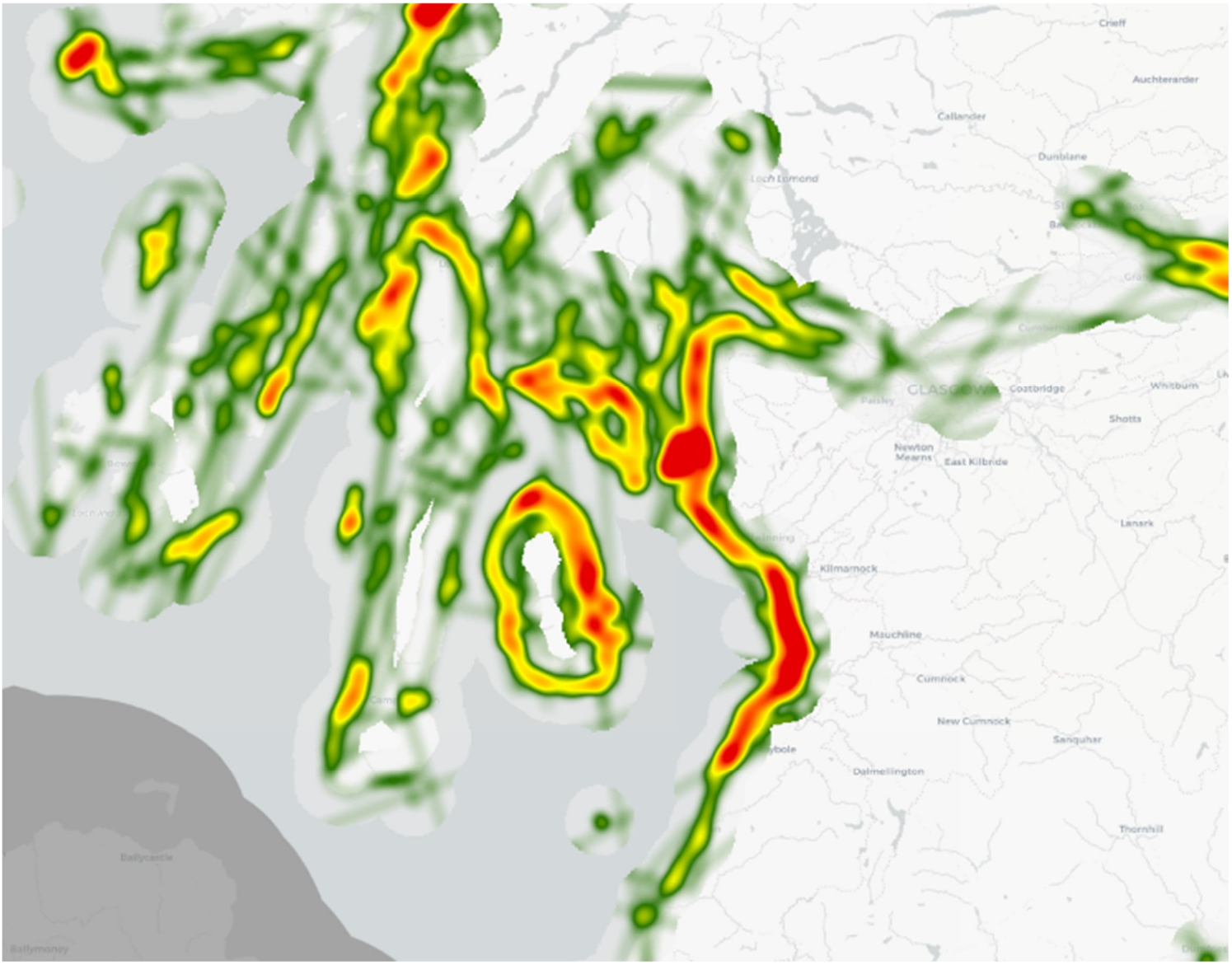
Graphic A4.20 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #18 “Surfing, surf kayaking or paddleboarding in the sea”)



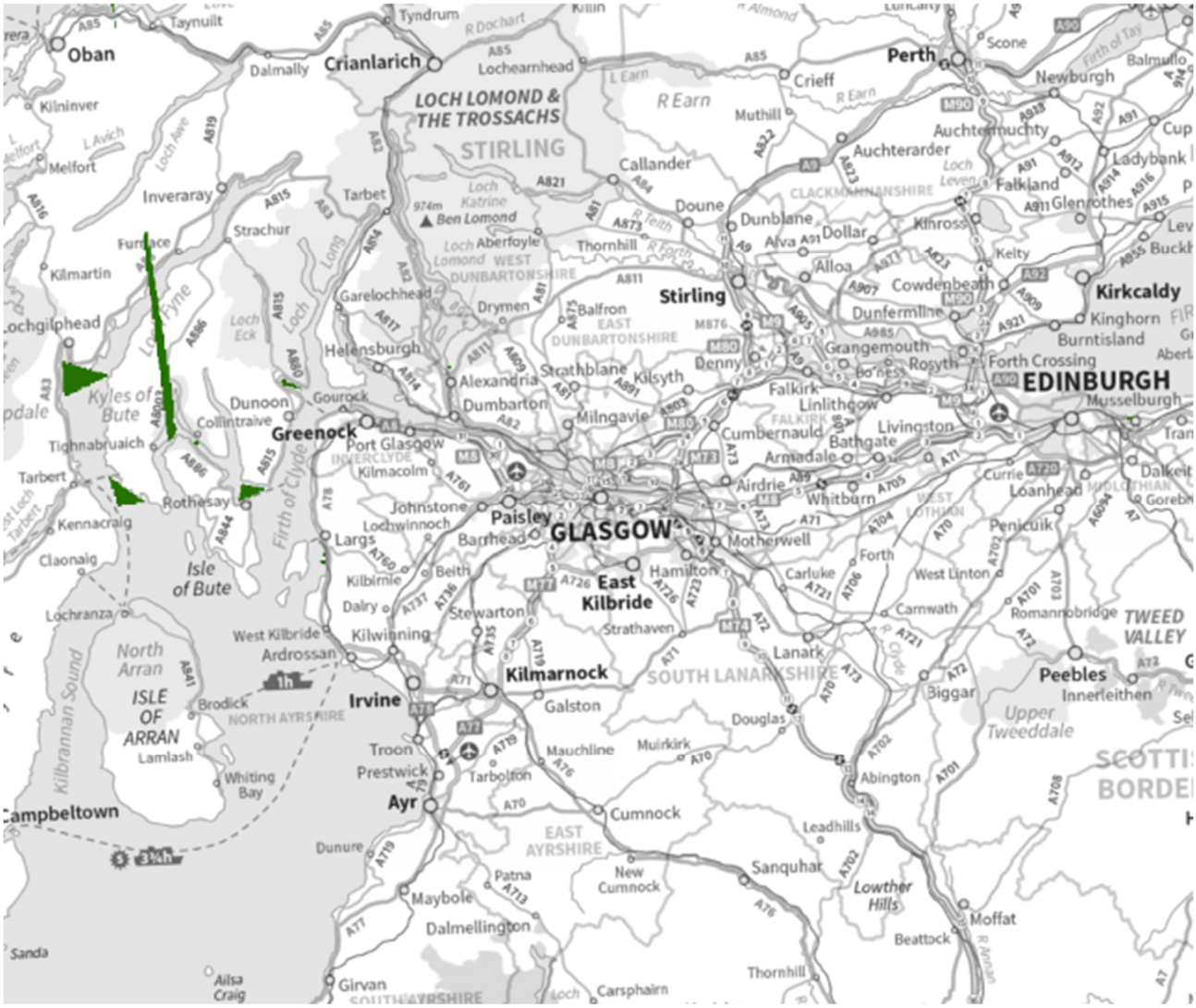
Graphic A4.21 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #19 “Visits to historic sites and attractions”)



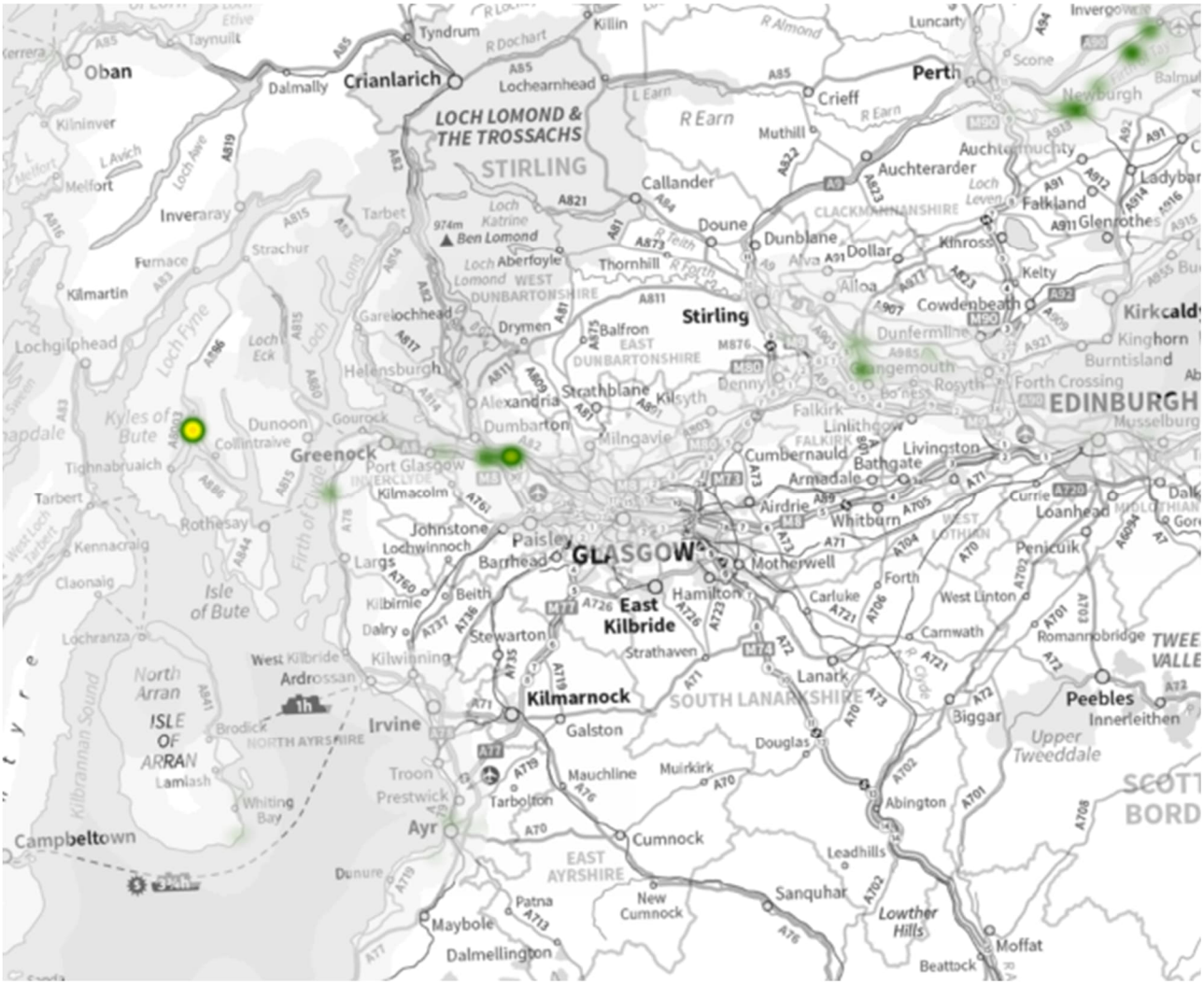
Graphic A4.22 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #20 “Walking at the coast”)



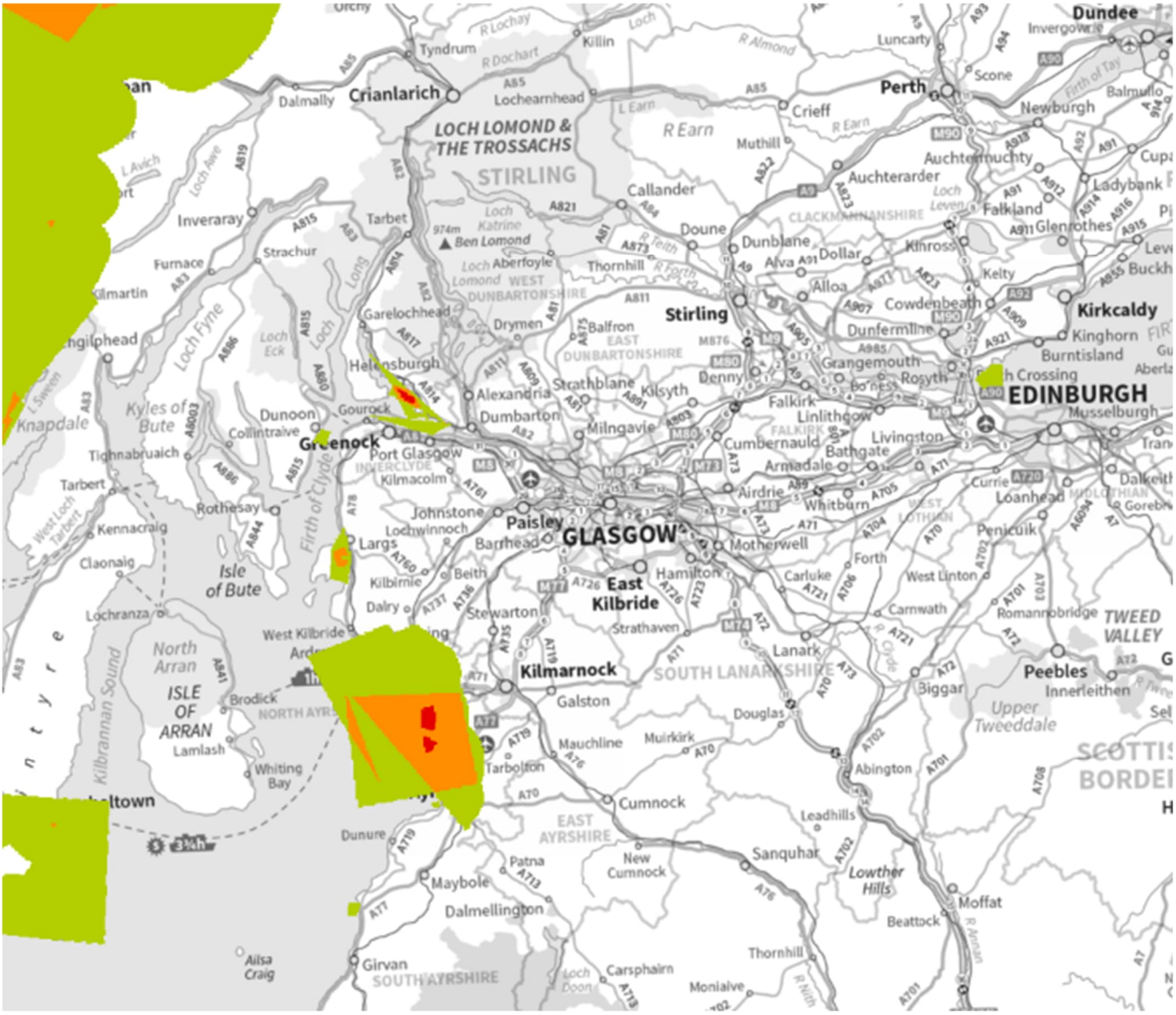
Graphic A4.23 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #21 “Water-skiing and wakeboarding in the sea”)



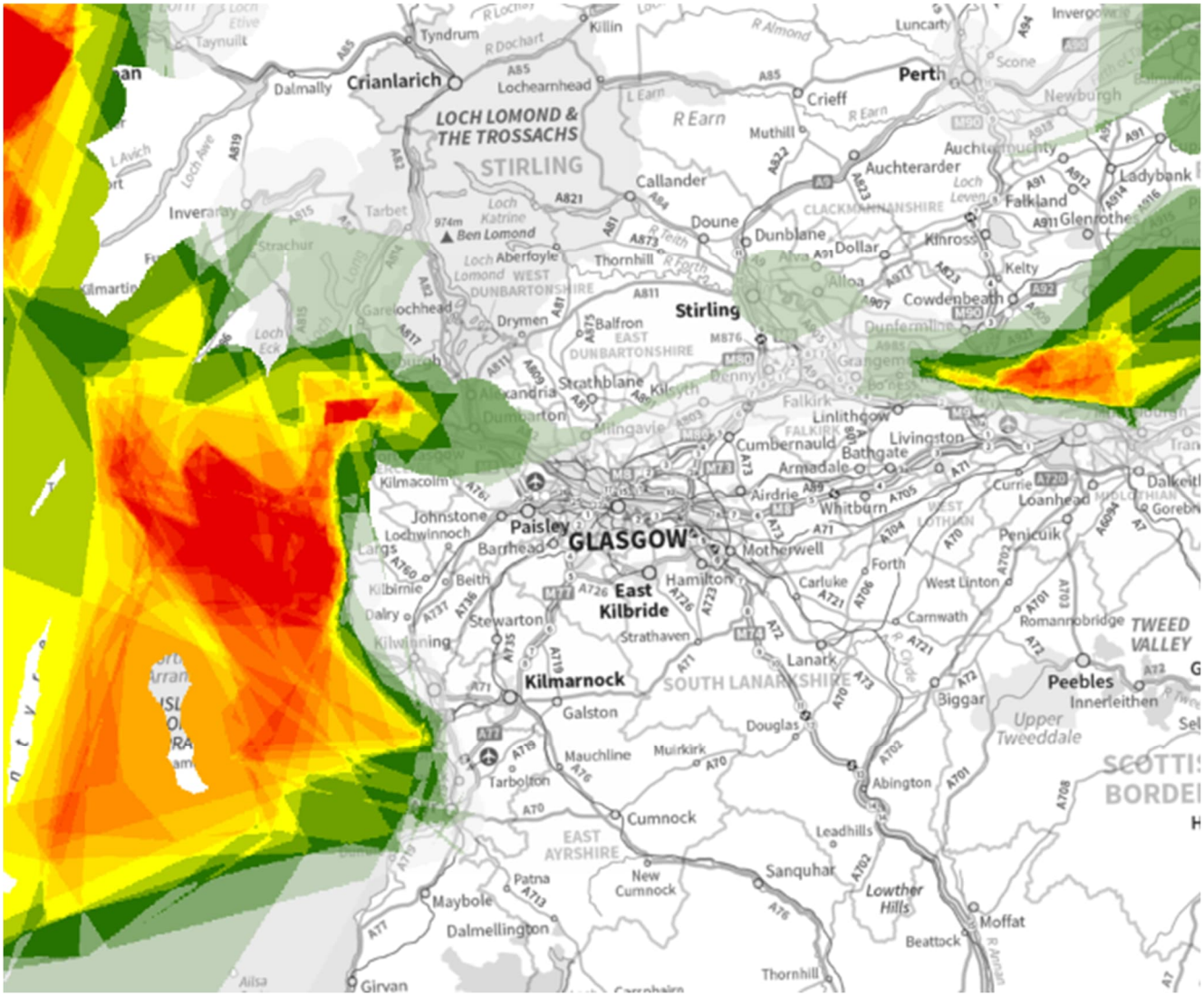
Graphic A4.24 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #22 “Wildfowling”)



Graphic A4.25 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #23 “Windsurf and kite surfing at the coast”)



Graphic A4.26 - Heat map showing intensity of marine recreational activities near the Isle of Arran (for activity #24 “Yacht racing at sea”)



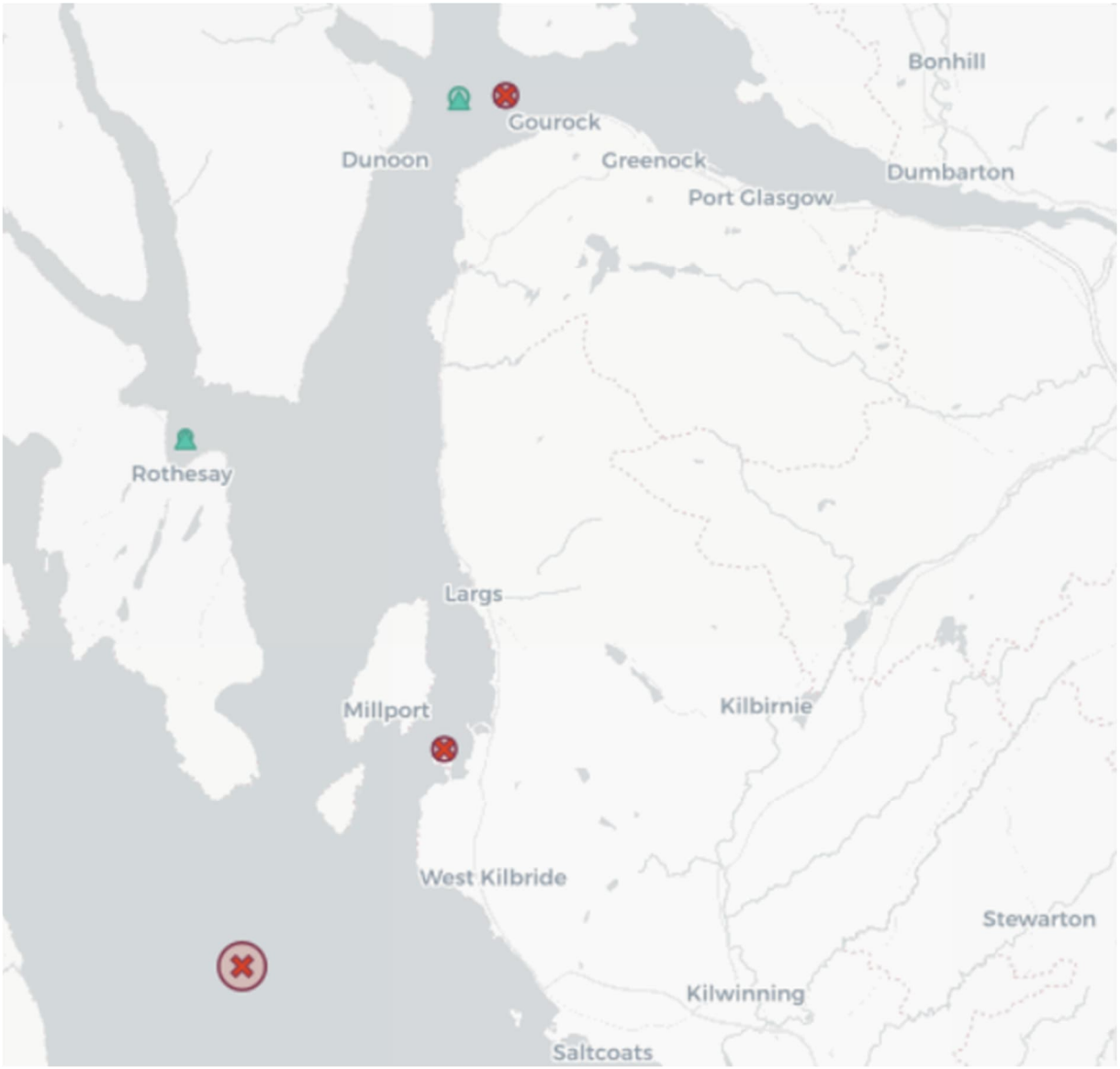
Appendix B

APPENDIX B – SUPPORTING GRAPHICS

The following figures are generated using The National Marine Plan Interactive (NMPI) service from Marine Scotland on the 26th March 2023. The mapping uses data from the Scottish Marine and Recreation Tourism Survey (Scottish Government, 2016) [mapping available at https://marinescotland.atkinsgeospatial.com/nmpi/default.aspx?layers=1041]

Figures are presented relating to selected maritime commercial services in the vicinity of the Proposed Works.

Graphic B4.1 - Dredge spoil disposal sites[1]

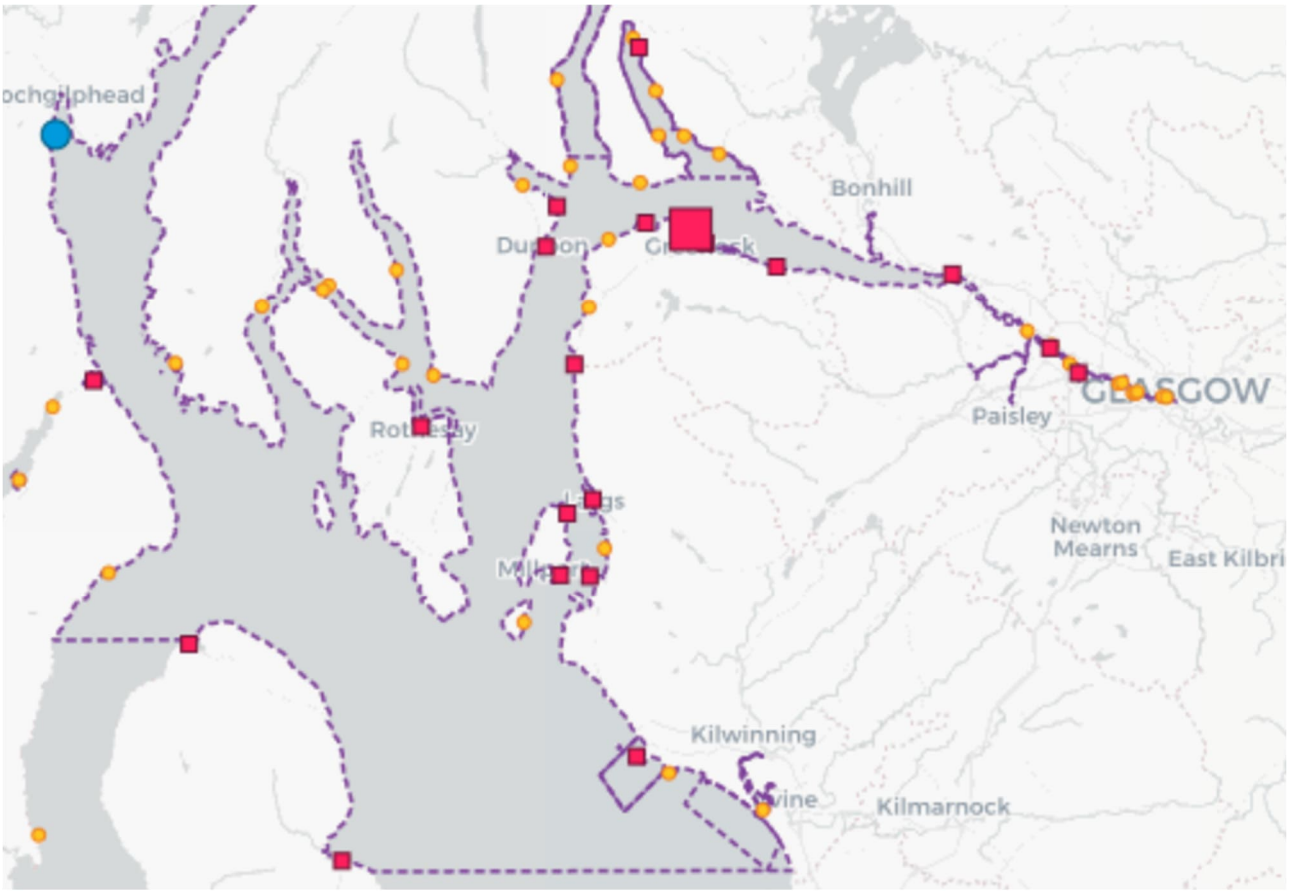


[1] **open (green); closed (red)**

Graphic B4.2 - Subsea power cables

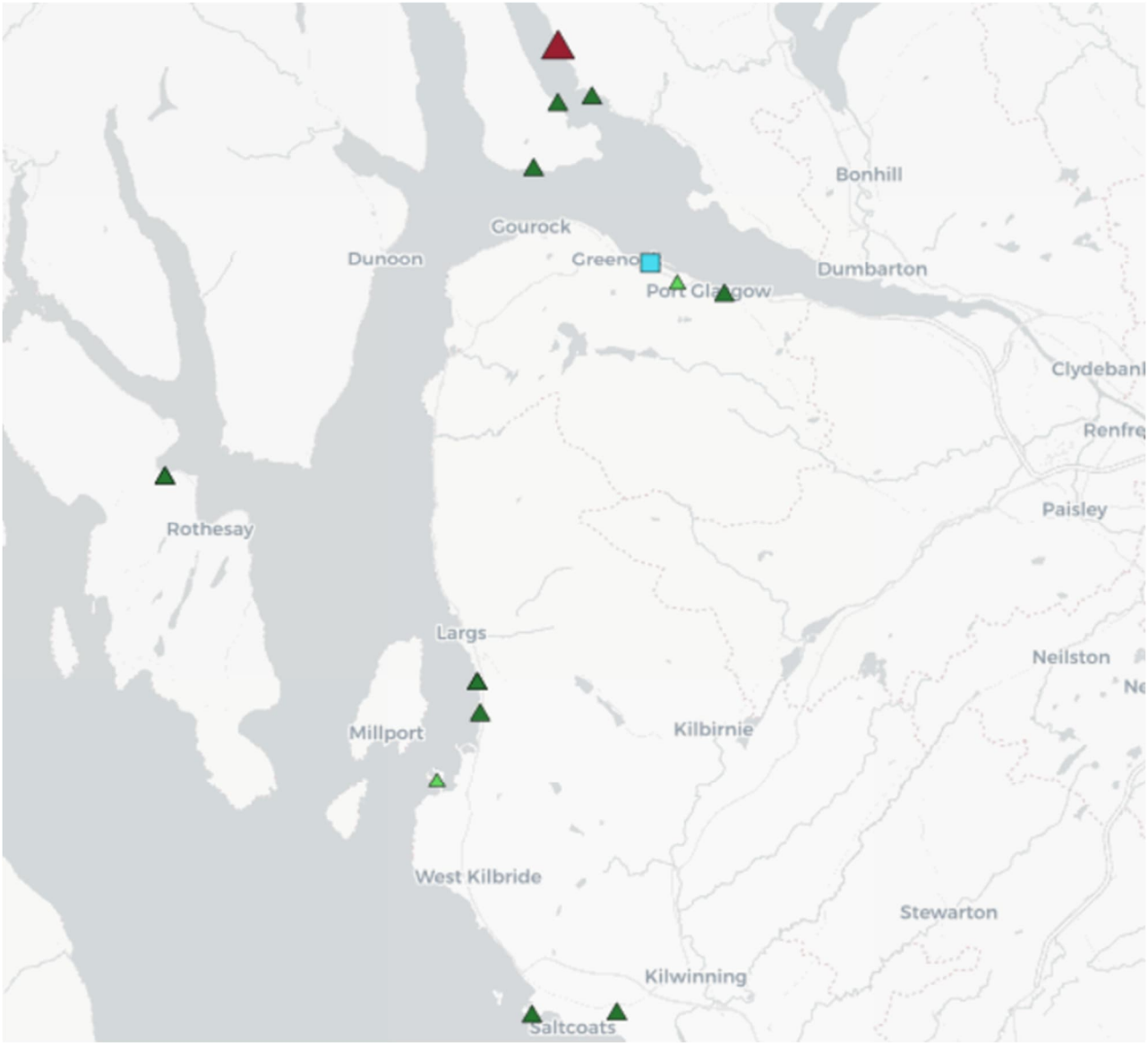
Graphic B4.3 - Coastal water abstraction points near the Works Area

Graphic B4.4 - Ports and Harbours[2]



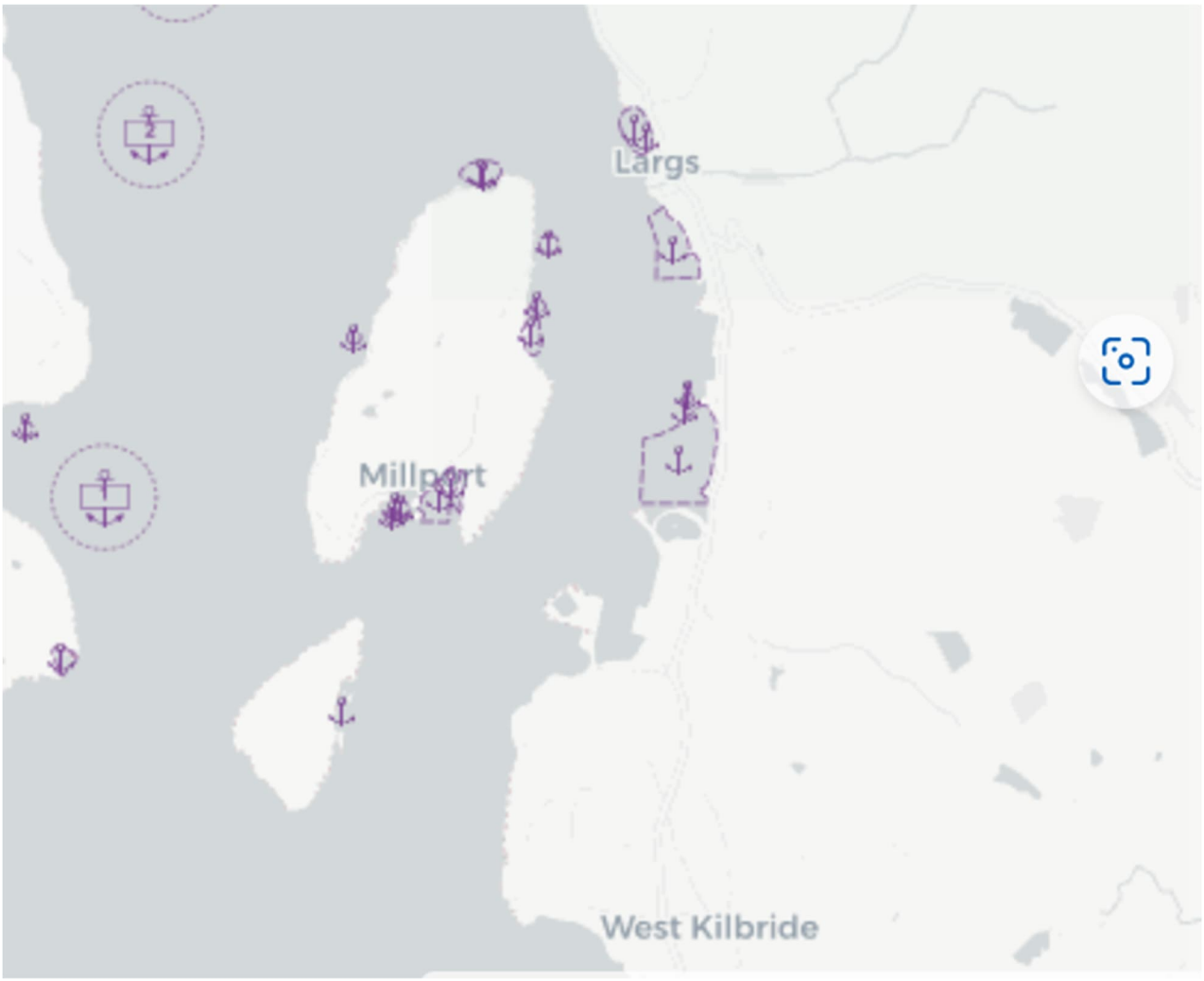
[2] Red symbols are major and contributing ports (using a Department for Transport classification). Blue shows minor ports, orange shows other ports, and the dotted outline is the statutory harbour limit.

Graphic B4.5 - Shipbuilding and repair yards[3]

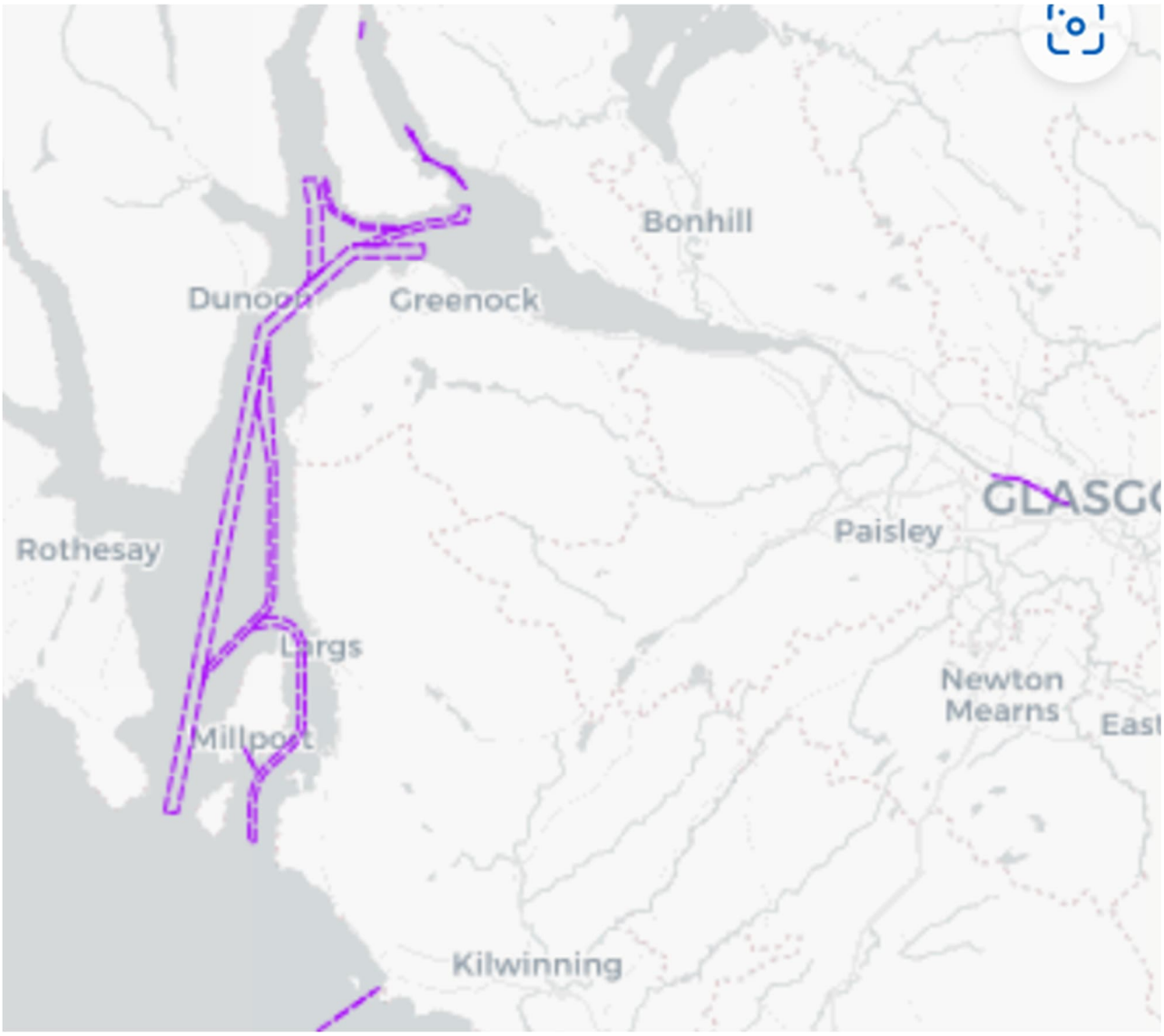


[3] Red is a major yard, dark green is an active location, pale green closed but with potential reuse, blue is dry dock facilities.

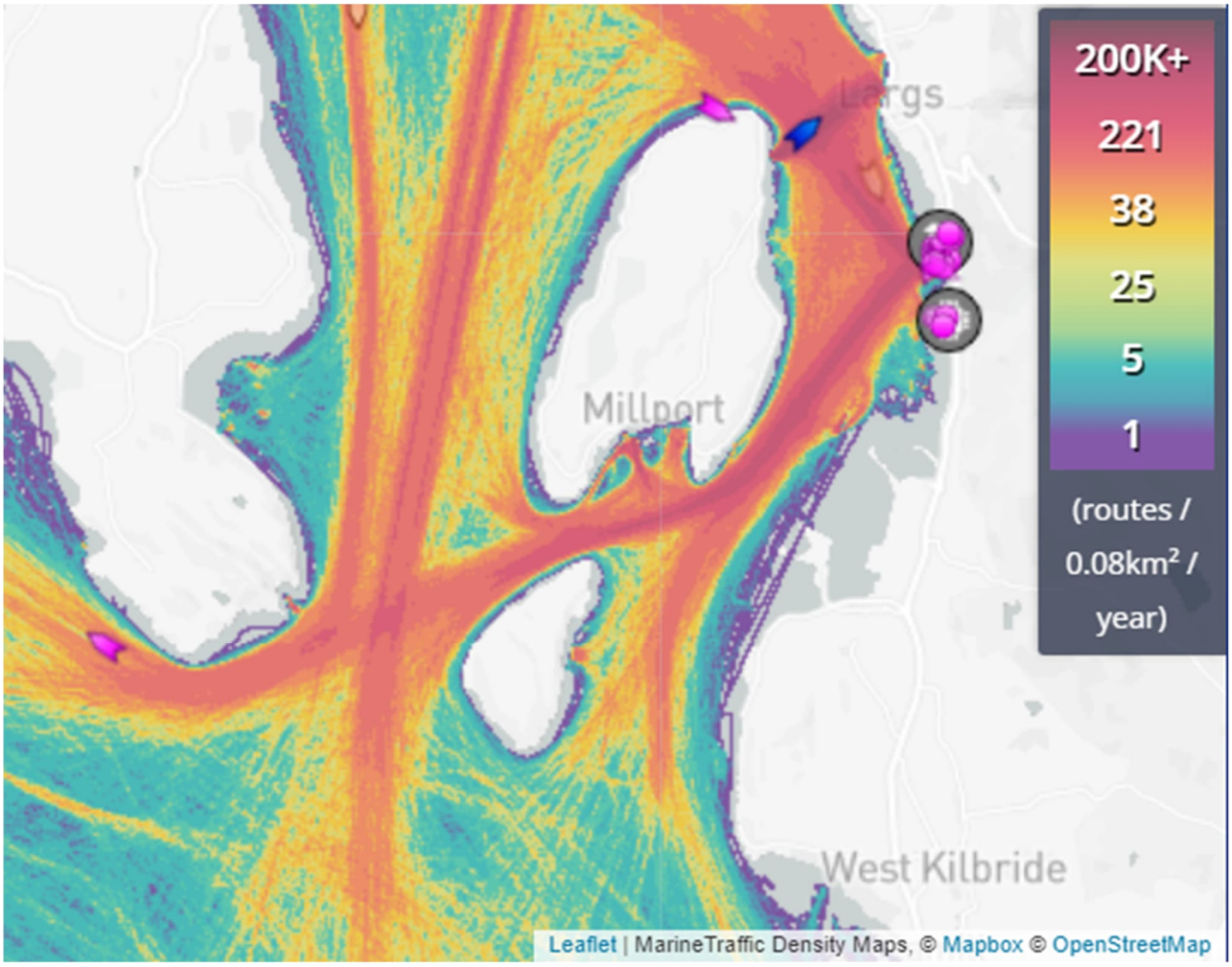
Graphic B4.6 - Anchoring berths (shown by anchors) and areas (shown by anchors with rectangles)



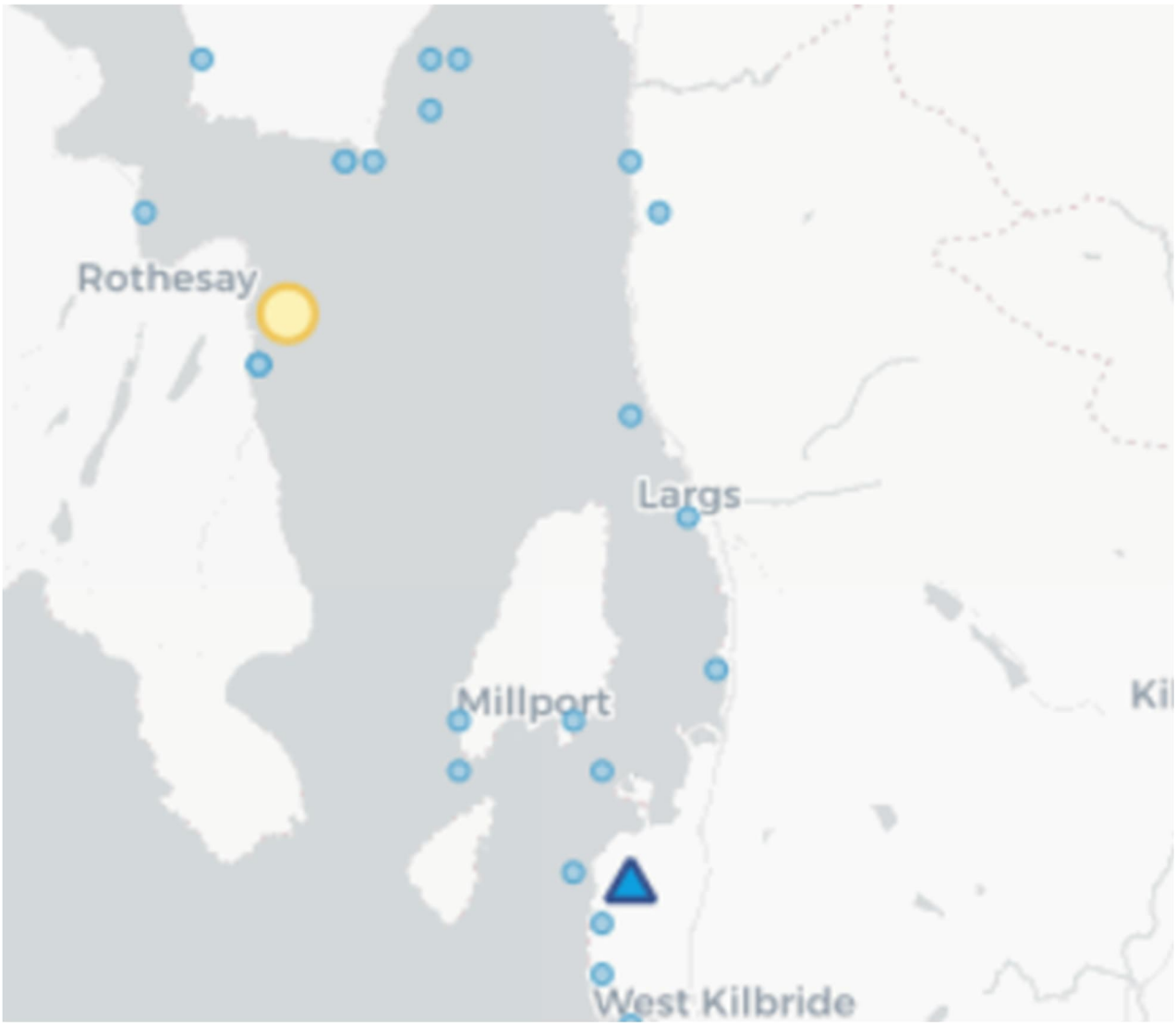
Graphic B4.7 - Navigation channels



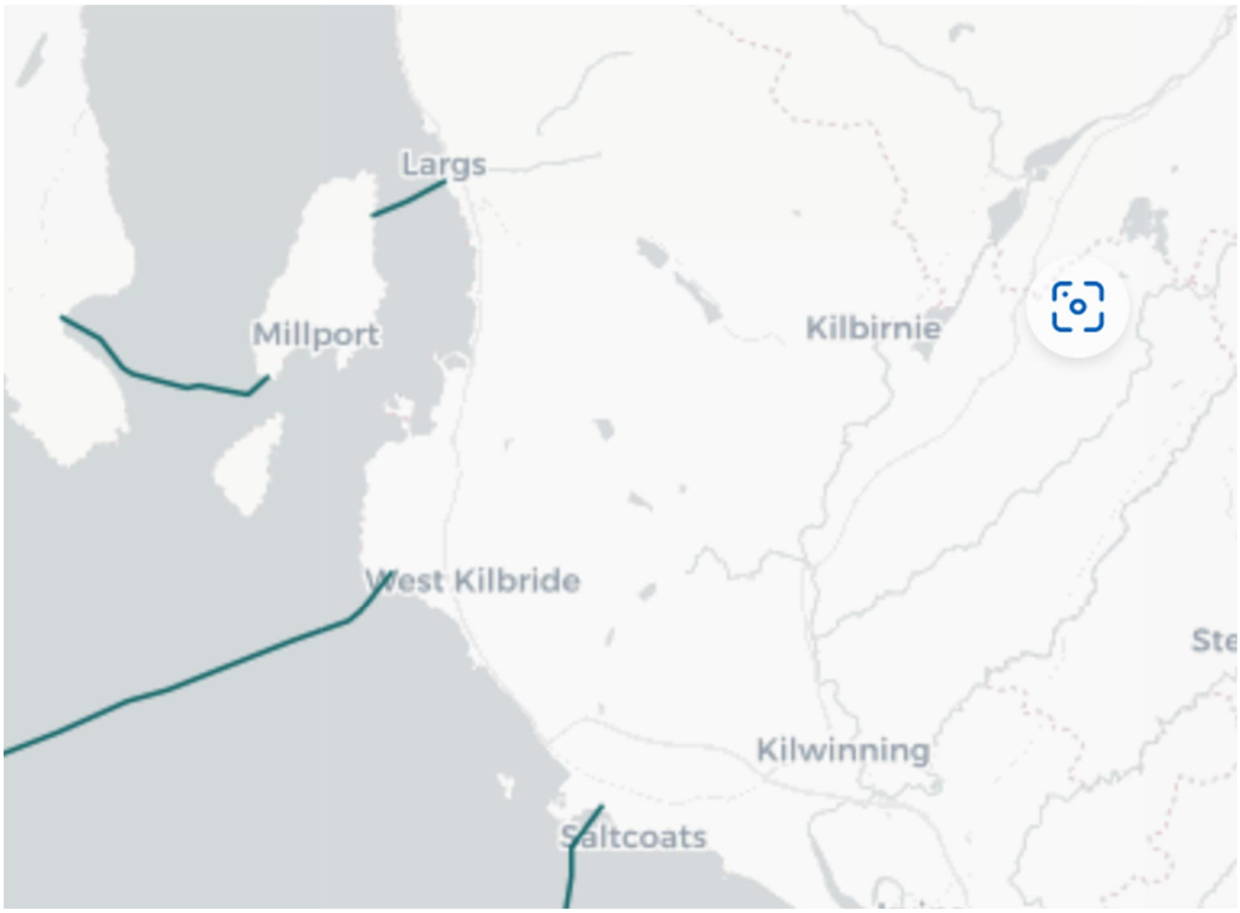
Graphic B4.8 - AIS shipping data for vessel routes near the islands of Great and Little Cumbrae



Graphic B4.9 - Coastal waste-water treatment plants



Graphic B4.10 - Telecommunications cables



Appendix 5C: Managing EIADR Compliance

November 2023

Appendix 5C: Managing EIADR Compliance

1. Introduction

1.1.1 Under a transfer agreement made in June 2021 between UK Government and EDF, the AGR stations will transfer from EDF ownership to the Nuclear Decommissioning Authority (NDA) after EDF has ceased generating electricity and defueled. Once Magnox, a subsidiary of the NDA, has obtained the necessary regulatory approval to become the holder of the Nuclear Site Licence for Hunterston B (HNB), the ownership of HNB will transfer to Magnox.

1.1.2 Since the transfer agreement was signed, EDF, NDA and Magnox Ltd. have been working together to develop a delivery plan for the decommissioning of HNB, realising synergies and opportunities to share site infrastructure across Hunterston A and HNB, aligning practice and processes, and sharing best practice and experience. The assumptions that underpin the EIADR application for HNB have been reviewed by NDA and Magnox Ltd. and confirmed as an appropriate basis for undertaking an Environmental Impact Assessment of the effects of decommissioning at the time the EIADR application has been submitted. The environmental effects and embedded environmental measures reported in the EIADR application have also been reviewed by NDA and Magnox Ltd. and confirmed as appropriate.

1.1.3 The EIADR consent for HNB will be transferred to Magnox Ltd. in parallel with the transfer of ownership of the HNB asset to be decommissioned. Post transfer, Magnox Ltd. will assume the responsibility for implementing the decommissioning plan, in accordance with the requirements of the EIADR. This will involve management of any residual uncertainties either about the decommissioning proposals, future baseline, and the associated environmental effects reported in the HNB EIADR application; and management of any change or extension to the decommissioning plan that could result in a significant environmental effect.

1.1.4 The approach to managing EIADR compliance is set out in this note. The approach reflects the approach currently taken by Magnox Ltd. in managing EIADR compliance across all Magnox Ltd. sites in so far as EIADR applies (set out in Magnox Ltd. Standard Procedure S-159 Compliance with Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations).

2. Developing the Environmental Management Plan

2.1.1 An outline Environmental Management Plan has been produced to accompany the HNB EIADR application. This includes:

- A summary of the environment effects during each stage of the decommissioning plan and for each environmental discipline;
- The agreed mitigation measures that are already identified in the Environmental Statement, as captured in the Mitigation Register;
- The work activities where mitigation measures may be required but where assessments to identify mitigation measures will only be possible in the future; and
- The options to implement work activities where mitigation measures may be required but where selection of an option will only be possible in the future, and identify the mitigation measures for those options, giving reasons for their selection.

2.1.2 On transfer Magnox Ltd. will review and develop the EMP and submit to ONR for approval in accordance with the relevant EIADR consent condition.

3. Maintaining an Environmental Impact Assessment Baseline

3.1.1 The following records will be transferred from EDF to Magnox Ltd. and will form the basis of an Environmental Impact Assessment Baseline for HNB:

- The environmental baseline surveys and findings that underpin the environmental baseline for the HNB EIADR application (see appended list of baseline survey reports);
- The HNB Environmental Statement that includes the Project Description, EIA Methodology, the conclusions of environmental assessment on effects and significant impacts, and associated mitigation measures;
- The HNB Decommissioning EIADR Assumptions Register; and
- The HNB Decommissioning Environmental Mitigation Register.

3.1.2 Magnox Ltd. will maintain and update the Environmental Impact Assessment Baseline on a regular basis to reflect:

- Any significant updates to the environmental baseline that arise from the programme of monitoring and environmental surveys (as set out in the outline EMP) in so far as they have potential to result in changes to the assessment reported in the HNB Environmental Statement;
- Any significant updates to the environmental baseline that arise from changes in environmental designations, environmental features or receptors, in so far as they have potential to result in changes to the assessment reported in the HNB Environmental Statement;
- Any changes to the HNB Decommissioning Plan that would require an alteration to the Environmental Statement Project Description and/or the EIADR Assumptions Register in so far as they have potential to result in changes to the assessment reported in the HNB Environmental Statement; and
- Any changes to mitigation, to replace or improve the effectiveness of mitigation.

4. Updates to the Environmental Management Plan

4.1.1 Annual reviews of the EMP will be undertaken and an updated EMP submitted to ONR. Updates will include:

- A record of mitigation measures implemented to date;
- Description of any changes made to mitigation measures, giving reasons for such changes; and
- Description of the effectiveness of implemented mitigation, including how the measures were assessed, monitored and recorded.
- A review of any updates to Environmental Impact Assessment Baseline. The updated EMP will highlighting where there have been changes in the baseline environment, assess whether changes in baseline could result in a change to the assessment findings and a change in significant environmental impacts previously reported in the Environmental Statement, and identify any additional mitigation measures required.

5. Assessing Changes or Extensions to the Decommissioning Plan

5.1.1 Changes or extensions to the Decommissioning Plan will be proposed, assessed, agreed and managed through the Magnox Ltd. engineering change or modification process. Part of the assessment of the change will include an assessment of the implications for the EIADR consent and identification of the need for amendment of the EIADR consent, if required, under Regulation 13 of the EIADR. The assessment will be informed by engagement with ONR and SEPA throughout the following steps:

- Step 1: Identification of whether a change or extension[1] to the decommissioning plan is a change to the consented decommissioning project as described in the Environmental Statement Project Description and/or the EIADR Assumptions Register.
- Step 2: Assessment, employing the skills and competencies of a SQEP, of whether the change or extension has the potential to have a Significant Adverse Environmental that has not previously been reported in the HNB Environmental Statement.
- Step 3: Where there could be potential for an additional Significant Adverse Environmental Impact that has not previously reported in the HNB Environmental Statement, consideration as to whether existing EIADR mitigations could be sufficient in managing the potential impact.
- Step 4: Where there is insufficient mitigation, undertake further EIA employing the skills and competencies of a SQEP and SME as required.
- Step 5: Provide information to the ONR under Regulation 13 of the EIADR to enable the ONR to determine whether EIA is required.
- Step 6: Where ONR determine that EIA is required, submit an application for consent, with an Environmental Statement, of the change or extension to ONR in accordance with the requirements Regulation 13 of the EIADR.

5.1.2 Once the relevant approvals have been obtained, any changes or extensions to the Decommissioning Plan, would be recorded in the Environmental Impact Assessment Baseline, with updates to the Project Description, Assumptions Register and Mitigation Register.

[1] A change or extension to the decommissioning plan could include changes to building requirements, changes to waste treatment/management/transport, changes to the decommissioning timescales, and changes in the use of resources (energy, water, materials).

6.

Air Quality

Appendix 6A: Air Quality Objectives in Scotland

Appendix 6A
Air Quality Objectives in Scotland

Table 6A.1 provides the Air Quality Standards (AQS) and AQOs relevant to Air Quality Assessments for NO_2, PM_{10} and $PM_{2.5}$. Currently these are the air pollutants of principal concern with respect to human health in Scotland.

Table 6A.1 Relevant Air Quality Standards and Objectives

Pollutant	Averaging period	Value (µg m^{-3})
NO_2	Annual mean	40
NO_2	1 hour mean, not to be exceeded more than 18 times a year (equivalent to 99.79th percentile)	200
PM_{10}	Annual mean	18
PM_{10}	24 hours mean, not to be exceeded more than 7 times a year	50
$PM_{2.5}$	Annual mean	10

Guidance from Defra in LAQM.TG22[1] establishes that exceedances of the human health-based AQOs should only be assessed at outdoor locations where members of the general public are regularly present over the averaging time of the objective.

Table 6A.2 provides examples of those locations that may be relevant for different averaging periods, as extracted from LAQM.TG22[1].

Table 6A.2 Examples of locations where Air Quality Objectives apply

Averaging period	Objectives should apply	Objectives should not apply
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public

[1] Defra (2022). Local Air Quality Management Technical Guidance (TG22) (Online) Available at: https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf (Accessed November 2023).

Averaging period	Objectives should apply	Objectives should not apply
		exposure is expected to be short-term.
24-hour mean, and 8-hour mean	All locations where the annual mean objectives would apply, together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
1-hour mean	All locations where the annual mean and: 24 and 8-hour mean objectives would apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where the public might reasonably be expected to spend one hour or more. Any outdoor locations at which the public may be expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15-min mean	All locations where members of the public might reasonably be expected to spend a period of 15 minutes or longer.	-

For NO_2, it is the annual mean objective that is the more stringent AQO. Monitoring results show that the 1-hour mean NO_2 AQO is unlikely to be exceeded if the annual mean objective is not exceeded. For PM_{10}, the 24-hour mean objective is more stringent than the annual mean.

The likelihood of exceedance of the NO_2 and PM_{10} short-term AQOs can be assessed with reference to the predicted annual means and the relationships recommended by the Local Air Quality Management Technical Guidance (LAQM.TG(22))[1]. The 1-hour mean NO_2 objective is unlikely to be exceeded if the annual mean is less than 60 μgm^{-3}. An estimate of potential exceedances of the 24-hour mean PM_{10} objective is given by:

$$Number\ of\ 24\ hour\ mean\ exceedences = -18.5 + 0.00145\ x\ annual\ mean^3 + \frac{206}{annual\ mean}$$

On the basis of the above relationship, the 24-hour mean objective for PM_{10} is likely to be met if the predicted annual-mean PM_{10} concentration is 31.8 μgm^{-3} or less.

Appendix 6B: IAQM Construction Assessment Methodology

November 2023

Appendix 6B
IAQM Construction Assessment Methodology

Step 2A - Define the potential dust emission magnitude

The following are examples of how the potential dust emission magnitude for different activities can be defined. (Note that not all the criteria need to be met for a particular class). Other criteria may be used if justified in the assessment.

Table 6B.1 – Definitions of dust emission magnitude

Dust Emission Magnitude	Activity
Large	**Demolition** >75,000m^3 building demolished, dusty material (e.g., concrete), on-site crushing/screening, demolition >12m above ground level
	Earthworks >110,000m^2 site area, dusty soil type (e.g., clay), >10 earth moving vehicles active simultaneously, >6m high bunds formed
	Construction >75,000m^3 building volume, on site concrete batching, sandblasting
	Trackout >50 HDVs out / day, dusty surface material (e.g., clay), >100m unpaved roads
Medium	**Demolition** 12,000 - 75,000m^3 building demolished, dusty material (e.g., concrete) 6-12m above ground level
	Earthworks 18,000 - 110,000m^2 site area, moderately dusty soil (e.g., silt), 5-10 earth moving vehicles active simultaneously, 3m - 6m high bunds
	Construction 12,000 - 75,000m^3 building volume, dusty material e.g., concrete, on site concrete batching
	Trackout 20-50 HDVs out / day, moderately dusty surface material (e.g., clay), 50 -100m unpaved roads

Dust Emission Magnitude	Activity
Small	**Demolition** <12,000m^3 building demolished, non-dusty material (e.g., metal cladding), <6m above ground level, work during wetter months
	Earthworks <18,000m^2 site area, soil with large grain size (e.g., sand), <5 earth moving vehicles active simultaneously, <4m high bunds
	Construction <12,000m^3, non-dusty material (e.g., metal cladding or timber)
	Trackout <20 HDVs out / day, non-dusty soil, < 50m unpaved roads

Step 2B - Define the Sensitivity of the Area

The tables below present the IAQM assessment methodology to determine the sensitivity of the area to dust soiling, human health and ecological impacts respectively. The IAQM guidance provides guidance to allow the sensitivity of individual receptors to dust soiling and health effects to assist in the assessment of the overall sensitivity of the Study Area.

Table 6B.2 – Sensitivities of receptors to dust soiling effects

Sensitivity of receptor	Description
High	• *Surrounding land where:* • *Users can reasonably expect enjoyment of a high level of amenity; or* • *the appearance, aesthetics or value of their property would be diminished by soiling; and* • *the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.* • *indicative examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms*

Sensitivity of receptor	Description
Medium	• *users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or* • *the appearance, aesthetics or value of their property could be diminished by soiling; or* • *the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.* • *indicative examples include parks and places of work.*
Low	• *the enjoyment of amenity would not reasonably be expected; or* • *property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or* • *there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land.* • *indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.*

Table 6B.3 – Sensitivity of the area to dust soiling effects

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Low	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 6B.4– Sensitivities of receptors to human health effects

Sensitivity of receptor	Description
High	• *Locations where members of the public are exposed over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals maybe exposed for eight hours or more in a day).* • *indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.*
Medium	• *locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).* • *indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM10, as protection is covered by Health and Safety at Work legislation.*
Low	• locations where human exposure is transient • indicative examples include public footpaths, playing fields, parks and shopping streets.-sensitive horticultural), footpaths, short term car parks and roads.

Table 6B.5 – Sensitivity of the area to human health impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration ($\mu g/m^3$)	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>18	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	16-18	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	14-16	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<14	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>18	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} Concentration ($\mu g/m^3$)	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
	16-18	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	14-16	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<14	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table 6B.6 – Sensitivities of receptors to ecological impacts

Sensitivity of receptor	Description
High	• *locations with an international or national designation and the designated features may be affected by dust soiling; or* • *locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain.* • *indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings*
Medium	• *locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or* • *locations with a national designation where the features may be affected by dust deposition.* • *indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.*
Low	• *locations with a local designation where the features may be affected by dust deposition.* • *indicative example is a local Nature Reserve with dust sensitive features.*

Table 6B.7 – Sensitivity of the area to ecological impacts

Receptor Sensitivity	Distance from the Sources (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Step 2C – Define the risk of impacts

The dust emissions magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts without mitigation applied. For those cases where the risk category is 'negligible' no mitigation measures beyond those required by legislation will be required.

Table 6B.8 – Risk of dust impacts

	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks and Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Step 3 – Site specific mitigation

Having determined the risk categories for each of the four activities it is possible to determine the site-specific measures to be adopted. These measures will be related to whether the site is considered to be a low, medium or high risk site. The IAQM guidance details the mitigation measures required for high, medium and low risk sites as determined in Step 2C.

Step 4 – Determine significant effects

Once the risk of dust impacts has been determined in Step 2C and the appropriate dust mitigation measures identified in Step 3, the final step is to determine whether there are significant effects arising from the construction phase. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.

7.

Climate Change

Appendix 7A: Data Sources

Appendix 7A
Data sources

A summary of the organisations that have supplied data for the GHG emissions assessment, together with the nature of that data, is outlined in **Table 7A.1**.

Table 7A.1 Data sources used to inform the GHG emissions assessment

Organisation	Data source	Data provided
Circular Ecology	Circular Ecology (2019). Embodied Carbon – The ICE Database (online). Available at: https://circularecology.com/embodied-carbon-footprint-database.html#.XKX_oJhKhPY	Embodied carbon figures from the ICE database are considered as the emission factor for calculating embodied carbon in the GHG assessment.
Department for Energy Security and Net Zero	Department for Energy Security and Net Zero (2023) Greenhouse gas reporting: conversion factors 2023 (online). Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023	DESNZ emission factors for waste disposal of materials were used in the GHG assessment.
Department of Transport	Table RFS0108: Domestic road freight statistics: July 2021 to June 2022 (online). Available at: https://www.gov.uk/government/statistics/domestic-road-freight-statistics-july-2021-to-june-2022	The distances travelled by construction vehicles were estimated using Department for Transport datasets.
Department of Transport	DfT (2023). NTS0403e: National Travel Survey: 2022 (online). Available at: https://www.gov.uk/government/statistics/national-travel-survey-2022	Data on commuting distances was used to determine the GHG emissions from construction workers travelling to the Works Area.

Appendix 7B: Climate Change Baseline

November 2023

Appendix 7B. Climate Change Baseline

7B.1 Baseline conditions

7B.1.1 This section sets out the baseline for the Proposed Works in relation to current and future baselines to understand future climate change trends.

7B.2 Data gathering methodology

7B.2.1 The following desk-based data sources were utilised to gather the information, as shown in **Table 7B.1.**

Table 7B.1 Key sources of data

Source	Summary	Coverage of Study Area
Met Office Western Scotland: Climate.	This document describes the main features of the climate for the region over a 30-year average period of 1981 – 2010.	Full coverage of the Study Area
Met Office Observational Climate Stations Data	The Met Office collect data from climate stations around the UK for a number of climate parameters. Largs is the most representative of the Project location.	10km from boundary of the Study Area / within the study area.
UKCP18 User Interface	This data source was used to obtain quantitative land projection data to inform future climate.	Full coverage of the Study Area

7B.3 Current baseline

7B.3.1 The current climatic conditions representative of the Works Area are presented below and provide context for the climate change impacts throughout the Proposed Works.

7B.3.2 The current climate for the area within which the Proposed Works are located is described in the report '*Met Office Western Scotland: Climate*'.[1] This report provides a regional climate summary for land conditions in Western Scotland with a focus on the 30-year averaging period of 1981 - 2010:

- mean annual temperature along the western coast of Scotland is in the range of 9.5°C to 9.9°C;
- February is the coldest month with daily minimum temperatures of between 1°C to 2°C. In contrast, maximum temperatures occur in July or August;
- annual rainfall totals vary from 1000mm – 4000 mm. Periods of prolonged rainfall can lead to widespread flooding, especially in winter and early spring when soils are usually near saturation and snowmelt can be a contributing factor; and
- West Scotland is one of the more exposed areas of the UK, being close to the Atlantic. The strongest winds are experienced in the winter.

7B.3.3 **Table 7B.2** sets out the observed climate data from Largs Climate Station for the period 1991 – 2020 and contextualises this against the regional data for western Scotland and for Scotland as a whole.

Table 7B.2 Baseline climate data 1991 – 2020

	Nearest Climate Station - Largs	Regional: Scotland West	Scotland
Mean Summer Rainfall (June, July, August) (mm)	280	369	317
Mean Winter Rainfall (December, January, February) (mm)	397	574	492
Monthly average rainfall (mm)	112.19	147.14	129.25
Days of rainfall > 1mm (days)	184.79	192.90	188.18
Minimum Annual Temperature (°C)	6.72	4.79	4.18
Maximum Annual Average Temperature (°C)	13.08	11.38	10.80

[1] Met Office, (2016). *Met Office Western Scotland: Climate* (online) Available at : https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/regional-climates/western-scotland_-climate---met-office.pdf (Accessed November 2023).

	Nearest Climate Station - Largs	Regional: Scotland West	Scotland
Mean Summer Temperature (June, July, August) (°C)	15.34	13.39	12.84
Mean Winter Temperature (December, January, February) (°C)	5.79	3.68	3.05
Mean wind speed at 10m (knots)	-	10.80	10.90
Air frost (days)	-	61.74	75.33

7B.3.4 Average seasonal rainfall at Largs weather station, Scotland West and Scotland for the period 1991–2020 is presented in **Table 7B.2**. It shows that the weather station is drier than both the region and the Scottish average year-round.

7B.3.5 The table also shows the long-term average seasonal mean temperature for Largs weather station, Scotland West and Scotland between 1991-2020. It shows that throughout the year the Site is warmer than both the region and Scottish average.

7B.4 Future baseline

7B.4.1 UKCP18 provides probabilistic data on projected climate variables for the UK for administrative regions. The data provides RCP projections until the end of the 21st century for different emissions scenarios.

7B.4.2 RCP8.5 is considered a high emissions pathway and represents a potential future which is slow to transfer to low-carbon energy provision. With progress towards achieving National Determined Contributions, RCP8.5 is considered a possible, but conservative, emission scenario suitable for evaluating the climate change resilience of infrastructure projects.

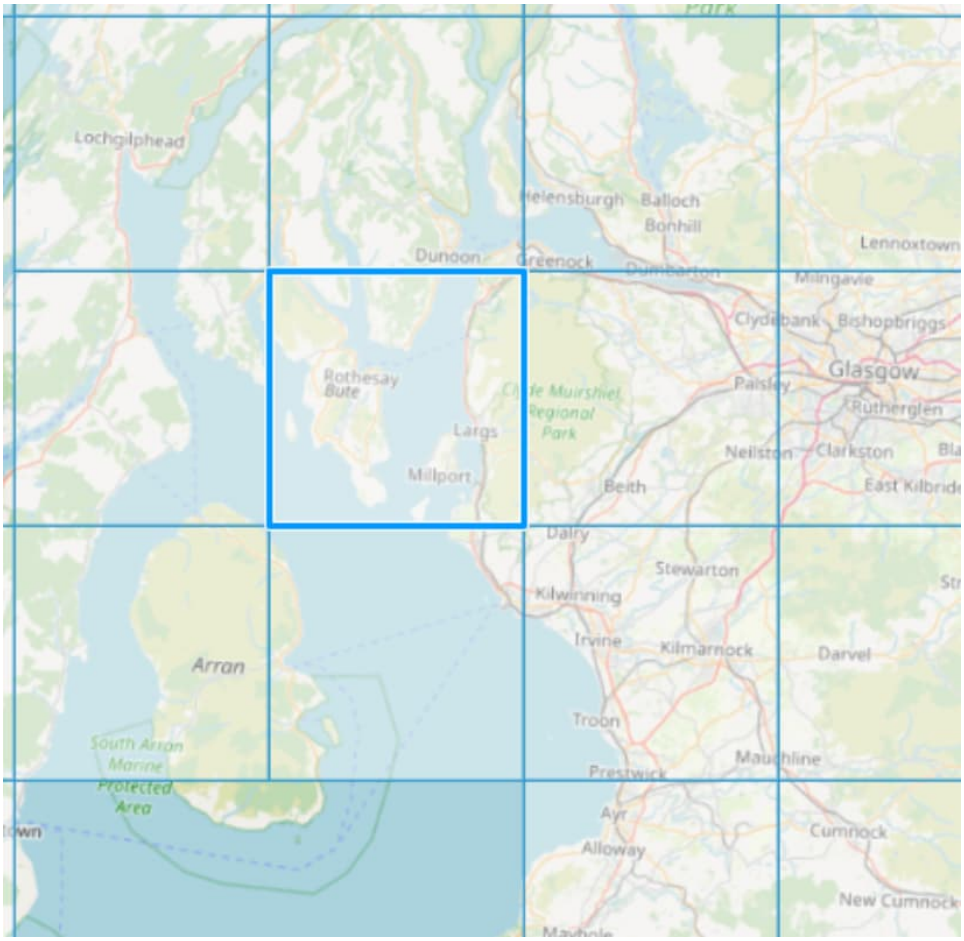
7B.4.3 In accordance with National Policy Statement EN-1, the 10th, 50th and 90th percentile are considered. Probabilistic climate projections, such as UKCP18, assign climate change outcomes based on a probability distribution function (PDF), which shows the possible range of climate change with the 50th percentile the median value.

7B.4.4 The future baseline is used to set out general climatic conditions and trends that would be experienced over the project lifetime identified in the temporal scope.

7B.4.5 The future climate has been presented for the 2030s (2020-2049), the 2050s (2040-2069) and 2080s (2070-2099) to identify the anticipated climate conditions. These projections are provided against the baseline period of 1981-2010 (based on model data), and 1991-2020 (current climate) as an indication of change from the baseline period.

7B.4.6 **Graphic 7B.1** shows the Study Area for the Proposed Works with each grid square representing 25km^2.

Graphic 7B.1 Study Area for UKCP18 data extraction



7B.4.7 **Table 7B.3** provides an overview of current and projected summer and winter temperature and rainfall for the location of the Proposed Works.

Table 7B.3 Temperature and rainfall data for the Model Reference (1981-2010), current (1991-2020) and future climate (2030s, 2050s and 2080s) for RCP8.5 (anomalies), the table shows the 50th percentile (10th percentile to 90th percentile) values

Climate Variable	RCP8.5		
	2030	2050	2080
Average summer Rainfall	-6.9% (-20.5% to +7.5%)	-12.0% (-29.1% to +4.7%)	-25.8% (-47.4% to -1.8%)
Average winter rainfall	+7.3 (-5.1% to +20.8%	+12.8% (-3.5% to +32.3%)	+26.6% (+0.7% to +57.7%)

Climate Variable	RCP8.5		
	2030	2050	2080
Average summer temperature	+1.0 oC (0.3 oC to 1.7 oC)	+1.8 oC (0.7 oC to 3.0 oC)	+3.8 oC (1.8 oC to 6.0 oC)
Average winter temperature	+1.4 oC (0 oC to 1.5 oC)	+0.8 oC (0.3 oC to 2.5 oC)	+2.6 oC (0.9 oC to 4.5 oC)
Min winter temperature	+0.8 oC (0.0 oC to 1.7 oC)	+1.5 oC (0.3 oC to 2.9 oC)	+2.8 oC (0.8 oC to 5.2 oC)
Max summer temperature	+1.0 oC (0.2 oC to 1.9 oC)	+1.8 oC (0.4 oC to 3.3 oC)	+4.1 oC (1.6 oC to 6.6 oC)

7B.4.8 **Table 7B.3** shows that precipitation (rainfall) is anticipated to increase in the winter months, with a clear shift to drier summers across all time periods. However, despite an overall trend towards drier summers, summer rainfall events are still expected.[2]

7B.4.9 The table also illustrates that mean temperatures are increasing across all seasons but especially in the summer. The extremes are greater than the mean values, with extreme maximum temperatures increasing throughout the time periods. This could lead to frequent and prolonged hot spells. Hot spells are defined as maximum temperatures exceeding 30°C for two or more consecutive days. By the 2090s, the frequency of hot spells is expected to increase.[3]

Wind

7B.4.10 UKCP18 indicates an increase in surface wind speeds over the UK for the second half of the 21st century during the winter season, where more significant impacts of wind are experienced. The frequency of winter storms would increase, however the increase in wind speeds is modest.[4]

[2] Met Office, (2018). *UKCP18 Factsheet: Precipitation*. (online) Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-factsheet-precipitation.pdf (Accessed November 2023).
[3] Lowe, J. A., et al. (2018). *UKCP18 Science Overview Report (Updated March 2019)* (online) Available at: https://www.metoffice.gov.uk/pub/data/weather/uk/ukcp18/science-reports/UKCP18-Overview-report.pdf (Accessed November 2023).
[4] Met Office, (2018). *UKCP18 Factsheet: Wind*. (online) Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-fact-sheet-wind_march21.pdf (Accessed November 2023).

Snow

7B.4.11 The UKCP18 projects by the 2070s show a decrease in lying winter snow of around 80-100% for the West of Scotland in both local (2.2km) and regional (12km) projections. Snowfall will also substantially decrease.[5]

Sea level rise

7B.4.12 The Project is located in close proximity to the Firth of Clyde. Therefore, it is at risk of future sea level rise. Sea level projections at the closest marine projections data point, adjacent west of the Proposed Works, range from 0.07m in the 2030s to 0.62m in the 2080s. **Graphic 7B.2** shows the Study Area for UKCP18 data extraction of sea level rise projections.

7B.4.13 **Table 7B.4** below depicts the projected sea level rise for the 2030s, 2050s and 2080s using UKCP18 marine projections data.

Graphic 7B.2 Study Area for UKCP18 data extraction of sea level rise projections

[5] Met Office, (2018). *UKCP18 Factsheet: Snow*. (online) Available from: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18_factsheet_snow_jul-2021.pdf (Accessed November 2023).

Table 7B.4 Sea level rise projections (m) presented as 50th percentile (10th percentile to 90th percentile) for the Development area

2030s	2050s	2080s
0.11 (0.07 to 0.16)	0.22 (0.14 to 0.30)	0.43 (0.28 to 0.62)

Appendix 7C: Climate Change Resilience of the Proposed Works

November 2023

7C. Climate Change Resilience of the Proposed Works

7C.1 Introduction

7C.1.1 This appendix presents the approach to embedding resilience within the Proposed Works to ensure that the Proposed Works are resilient to the effects of climate change. The appendix refers to Consolidated Hazards Safety Case[1] which relates to the resilience of the Hunterston B facility and associated infrastructure. The Consolidated Hazards Safety Case details the risks faced by the infrastructure on the Hunterston B facility and associated infrastructure (including the reactor). It also contains assessments which demonstrate how these risks are reduced to as low as practicably possible. It assesses the climate risks that are faced by the facility. They include extreme winds, flooding (coastal and pluvial), extreme ambient air temperature, increased risk of lightning, drought and snow). It concludes that the Site is resilient during extreme events. The safety case will be regularly updated throughout the lifecycle of decommissioning to re-evaluate and outline any necessary actions to maintain safety on-site which will include ensuring resilience of the site to climate change effects.

7C.2 Approach to resilience to specific climate hazards

7C.2.1 The following section summarises relevant sections the Consolidated Hazards Safety Case, which illustrate the approach to resilience of the facility to climate change.

Flooding

7C.2.2 Section 7.13 of the Consolidated Hazards Safety Case addresses external flooding risk of the site. It highlights that the most significant threats are associated with extreme rainfall and wave overtopping of sea defences. It concluded that credible extreme rainfall and wave overtopping do not pose a threat to the main station plant buildings, even in the most pessimistic scenarios, in which combined events occur.

7C.2.3 These conclusions are developed by the assessment included in **Chapter 11: Surface water and flood risk**, which includes allowances for climate change due to the extended timeframe for the Proposed Works.

7C.2.4 The design event for the purposes of the Flooding Risk Assessment is the 0.5% Annual Exceedance Probability (plus climate change) for the duration of the Proposed Works up to 2125. The future baseline section has considered SEPA climate change allowances based upon the latest UKCP18 climate change scenarios. This includes information derived from a range of coastal and pluvial modelling studies, which taken together with a range of existing and proposed embedded environmental measures will help minimise any potential effects on flood risk receptors.

7C.2.5 The assessment within **Chapter 11: Surface water and flood risk** considers a number of predicted effects. These include an increase in surface water flood risk over time due to the influence of climate change, including the potential for more intense rainfall, and an increase in tidal flood risk towards the Site and surrounding areas as a result of changes

[1] EDF Energy (2014) Hunterston B Consolidated Hazards Safety Case Head Document

in wave energy, and resultant effects on tidal erosion, sediment deposition and weakening of flood defences. It concludes in both cases that predicted effects are **Not Significant**.

7C.2.6 In addition to these conclusions, the HNB Safety Case will be periodically reviewed to take account of future updates to climate change allowances. Should changes in coastal protection be required then the HNB Safety Case process will ensure their timely identification.

Extreme winds

7C.2.7 For the Consolidated Hazards Saocfety Case, an assessment of the risk to the Hunterston B facility, posed by extreme wind was conducted. It took into account a 1 in 10,000 year wind event. The assessment demonstrated that although local damage would be expected on some surrounding site infrastructure the reactor protection would not be disabled.

7C.2.8 Updated safety cases will further examine updated understandings of the effect of climate change on wind speeds and will ensure that design specifications for buildings on-site specify protection from these effects.

Extreme Ambient Temperatures (High and Low)

7C.2.9 The Consolidated Hazards Safety Case contains an assessment of the effects of both extreme high and low temperatures on the plant and equipment at Hunterston B. The assessment uses extreme temperatures from the Edinburgh Meteorological Office, relevant temperature records and extreme value analysis. The assessment shows that both extreme high and extreme low temperatures will not have any significant effects on reactor protection or the reactor itself.

Lightning

7C.2.10 The Consolidated Hazards Safety Case states that Hunterston B was initially designed to mitigate the effect of lightning strikes and lighting protection provisions were incorporated into the civil structure on the site. The installed lightning protection equipment is inspected on regular basis and as such the occurrence of lightning is not deemed to be a risk to the site. As such, it is not expected that lightning poses risk to the reactor at the site.

Drought Hazard

7C.2.11 The Consolidated Hazards Safety Case assessed the risk caused by drought at the Hunterston B site. It concluded that the plant and equipment would not be adversely affected by drought. It was acknowledged that climate change has the potential to increase the frequency and duration of droughts in the UK, but that this would not invalidate the safety case.

7C.3 Maintaining the Safety Case

7C.3.1 Throughout the Proposed Works, the Safety Case will be maintained to ensure that the Safestore and Reactor building are resilient to the above climate hazards. The Safety Case will inform the design standards of different elements of the Proposed Works throughout its lifecycle. This will ensure that climate hazards will be considered at each stage of detailed design.

8.

Terrestrial Biodiversity and Ornithology

Appendix 8A: Baseline Report Desk Study (Terrestrial Ecology)

November 2023

EDF Energy

Hunterston B Decommissioning EIA

Baseline Report: Desk Study (Terrestrial Ecology)

Wood Environment & Infrastructure Solutions UK Limited – April 2020

Report for

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Document revisions

No.	Details	Date
1	Draft for client Review	October 2019
2	Final	December 2019
3	Final Report	April 2020

Contents

1. Introduction

1.1 Purpose of this report

EDF Energy proposes to start preparation for waste processing facilities (Operational and Decommissioning Waste) and waste stores (ILW Store) at Hunterston B (HNB) to support decommissioning activities following the End of Generation (EoG), which is currently scheduled to be in 2023. Prior to the construction of these facilities, planning permission from the Local Planning Authority (LPA) under Town and Country Planning (Scotland) Act 1997 (TCPA) will be required. Other permissions and consents for the overall decommissioning project will be required separately under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning (EIAD)) Regulations, 1999, as amended, and EURATOM Article 37 (or an equivalent).

The current strategy is for an EIA to be undertaken and a single Environmental Statement (ES) to be prepared to assess the environmental impacts of the proposed decommissioning project under both the TCPA and EIAD Regulations. Other consents for specific activities will also be required and can draw on the EIAs.

This report sets out information about the desk-based study of terrestrial ecology undertaken to inform the Environmental Impact Assessment (EIA) of the HNB Decommissioning Project. It includes a brief description of the proposed HNB Decommissioning Project before setting out information about the terrestrial ecology desk study methods, results and conclusions. A separate desk study has been prepared for ornithology (*Hunterston B Decommissioning EIA – Baseline Report: Birds*). Sensitive information pertaining to the location of badger setts is provided separately in a Confidential Report (*Hunterston B Decommissioning EIA - Baseline Report: Badger*).

1.2 Scheme description

Decommissioning at HNB is expected to commence in 2023. The site location is shown on **Figure 1.1, Appendix A**. Once the necessary consent is in place, the decommissioning process ('the Project') would commence with the process of defueling and initial decommissioning, with spent fuel transferred to the Sellafield nuclear licensed site. Over a period of approximately 15 years, there will be a process of safe storage and management of intermediate and low-level waste, with intermediate-level waste stored temporarily on or near the site, in sealed and shielded containers within designed stores that have similar characteristics to industrial units, and low-level waste being transferred to appropriate treatment or disposal facilities. In parallel with these tasks, redundant buildings will be de-planted and demolished.

This initial decommissioning phase will include construction of waste processing facilities and a secure, weathertight, Safestore structure - a clad, steel-framed structure based around the Reactor Building - will be constructed, to enclose the Advanced Gas-cooled Reactors, allowing the process of radioactive decay to reduce dose to significantly lower levels. The second phase of decommissioning – Care & Maintenance – will involve ongoing site/station care and maintenance over a period of approximately 70 years. The third phase will involve reactor building decommissioning and final site clearance, involving site-wide demolition of the remaining buildings and remediation to an extent conforming to the applicable regulations at the time, followed by back-filling. Aside from the defueling and management of waste storage and decay processes, the site will operate similar to a conventional construction/demolition site.

1.3 Site Context

The HNB Station ('the Site' or 'the Station') is in North Ayrshire, approximately 9km south of Largs and 4km north-west of West Kilbride, on the Firth of Clyde coast. The approximate centre of the Site is situated at Ordnance Survey (OS) Grid Reference NS 18400 51400, and the Nuclear Site Licence (NSL) boundary extends

to approximately 30ha. The operational Station is predominantly built structures and hard standing, including access and car parks. Hunterston A (HNA) is situated to the west of, and immediately adjacent, to HNB.

2. Methodology

2.1 Study Area

The Site includes the land inside the HNB double security fence and the additional land that is covered by the HNB Nuclear Site Licence (NSL), as indicated on **Figure 1.1, Appendix A**. The area over which ecological features may be subject to significant effects, as a result of the HNB Decommissioning Project, is referred to as the potential 'Zone of Influence' (Chartered Institute of Ecology and Environmental Management ([CIEEM], 2018[1]), which varies for different ecological features depending on their sensitivity to environmental change together with the nature of the proposed works. It is therefore appropriate to define different 'Study Areas' to encompass the potential Zone of Influence.

The categories of ecological features that could be significantly affected by the HNB Decommissioning Project are summarised below. These are the sites, habitats and species that are of sufficient nature conservation value that impacts on them could result in significant effects:

- Statutorily designated biodiversity conservation sites (statutory biodiversity sites):
  - Special Areas of Conservation (SACs) – sites designated under Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the Habitats Directive) as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive;
  - Special Protection Area (SPA) – sites designated under the European Council Directive 2009/147/EC on the conservation of wild birds (the Birds Directive). SPAs protect rare and vulnerable birds (listed on Annex I of the Birds Directive) and regularly occurring migratory species;
  - Sites of Special Scientific Interest (SSSIs) – these sites have been re-notified under the Wildlife and Countryside Act 1981 (as amended in Scotland) and provide statutory protection for the best examples of the UK's flora and fauna;
  - National Nature Reserves (NNRs) – these are designated under the National Parks and Access to the Countryside Act 1949 or the Wildlife and Countryside Act 1981 (as amended) and contain examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems; and
  - Local Nature Reserves (LNRs) – these are declared under the National Parks and Access to the Countryside Act 1949 and managed for nature conservation.
- Designated non-statutory biodiversity conservation sites (non-statutory biodiversity sites):
  - Local Nature Conservation Sites (LNCSs) such as: Listed Wildlife Sites (LWS), Sites of Importance for Nature Conservation (SINC), Scottish Wildlife Trust (SWT) Wildlife Sites (including provisional SWT Wildlife Sites); and
  - Areas included on the Ancient Woodland Inventory (AWI) or Semi Natural AWI[2];

[1] Chartered Institute of Ecology and Environmental Management (CIEEM). (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. Chartered Institute of Ecology and Environmental Management, Winchester.

[2] Ancient woodland is land that has been continually wooded since at least 1750. The Ancient Woodland Inventory (https://gateway.snh.gov.uk/natural-spaces/dataset.jsp?dsid=AWI) maps Scotland's ancient and mature woodlands.

- Important[3] habitats and species:
  - Habitats and species of principal importance for the conservation of biological diversity in Scotland – these habitats and species are included on the Scottish Biodiversity List[4] (SBL);
  - Bird species on the Birds of Conservation Concern (BoCC) Red List (Eaton et al 2015[5]).
  - Species listed as being of conservation concern in the relevant UK Red Data Book (RDB);
  - Nationally Scarce species - species recorded from between 16 and 100 10 x 10 km squares of the Ordnance Survey (OS) grid; and
  - Habitats and species listed in the Local (Ayrshire) Biodiversity Action Plan (LBAP).
- Legally protected species:
  - European Protected Species as defined within the EC Habitats Directive and translated into UK legislation through The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the Habitats Regulations);
  - Species included on Schedule 1, 5 and 8 of the Wildlife and Countryside Act 1981 (WCA) (as amended in Scotland), excluding species that are only protected in relation to their sale; and
  - Badgers, which are protected under the Protection of Badgers Act 1992, as amended by the Nature Conservation (Scotland) Act 2004.

Invasive/non-native species are also taken into account. In Scotland the spread of non-native plant species is covered by Section 14C of the Wildlife and Countryside Act 1981 (as amended in Scotland), which makes it an offence to plant or otherwise cause to grow any plant out-with its native range. Guidance on non-native species is set out within the Non-Native Species Code of Practice[6].

The study areas relating to each of the ecological features listed above have been defined on a precautionary basis to encompass the predicted 'Zone of Influence' of the Project. These areas have been defined based on the professional judgement of experienced ecologists, and informed by good practice guidance (e.g. CIEEM, 2018 and Collins, 2016[7]). The desk study areas relevant to terrestrial ecology are summarised below.

2.2 Desk Study

A desk-based study was undertaken in August 2019, in accordance with good practice (Chartered Institute of Ecology and Environmental Management (CIEEM) 2018). The Desk Study Area has been defined around the site on a precautionary basis:

- Statutory biodiversity sites within 10km;
- Non-statutory biodiversity sites within 3km;

[3] Ecological Assessment typically focuses on 'Important' ecological features (habitats, species, ecosystems and their functions/processes). 'Important' habitats and species are typically those that are not widespread, unthreatened and resilient to project impacts (CIEEM 2018).

[4] The Scottish Biodiversity List is a list of plants, animals and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation (https://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL)

[5] Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A, Gregory, R.D. (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746

[6] https://www2.gov.scot/Resource/0039/00398608.pdf

[7] Collins, J. (2016). *Bat Surveys: Good Practice Guidelines*. 3rd ed. Bat Conservation Trust, London

- Important habitats within 3km;
- Records of legally protected species and other important species within 3km, extended to 5km with respect to bats and bat roosts, recognising that the majority of bats' Core Sustenance Zones are within 5km of their roosts (Collins 2016); and
- Water bodies within 500m, which is the distance that great crested newts are generally regarded to disperse from waterbodies where they breed (English Nature, 20018)

Information regarding statutory biodiversity sites was acquired using the Scottish Natural Heritage (SNH) Sitelink web-based application[9] and the North Ayrshire Council website[10]. Records of important and legally protected species were obtained from the South West Scotland Environmental Information Centre (SWSEIC), formally known as Dumfries and Galloway Environmental Records Centre. The desk study focuses on species records within the last ten years. Information on non-statutory biodiversity sites was also obtained from the North Ayrshire Council website. Waterbodies were identified from 1:25:000 scale Ordnance survey (OS) maps[11] and aerial imagery (Google Maps[12] and Bing Maps[13]).

Recent, relevant documents relating specifically to biodiversity conservation and monitoring work undertaken by EDF Energy have also been reviewed for information relating to protected/notable species within the HNB land ownership boundary:

- Hunterston Integrated Land Management Plan (ILMP)[14]; and
- Hunterston B Annual Land Management Reviews (LMARs)[15].;

[8] English Nature. (2001). Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.
[9] https://gateway.snh.gov.uk/sitelink/searchmap.jsp
[10] https://www.maps.north-ayrshire.gov.uk/sites/ldp/
[11] www.ordnancesurvey.co.uk
[12] www.maps.google.co.uk
[13] https://www.bing.com/maps
[14] EDF Energy Nuclear Generation Ltd (2017) Hunterston Integrated Land Management Plan.
[15] EDF Energy Nuclear Generation Ltd (2013 to 2018). Hunterston B Land Management Annual Review

3. Results

3.1 Designated biodiversity sites

There are four statutory biodiversity sites within 10km of the Site. There are 20 non-statutory biodiversity sites within 3km of the Site, these are Local Nature Conservation Sites (LNCS)[16], fifteen of these sites (referred to below as 'LNCS (AWI)') are also included on the Ancient Woodland Inventory (AWI). Further details of these sites are included in **Table 3.1** and on **Figure 3.1** and **3.2, Appendix A**.

Table 3.1 Statutory and non-statutory biodiversity sites

Site	Designation	Grid Reference	Summary reasons for designation	Proximity to the Site (Approx.)
STATUTORY SITES				
Portencross Woods	SSSI	NS 17736 50007	One of the best examples of semi-natural coastal woodland (Upland mixed ash woodland) in North Ayrshire. The botanically-rich woodland is situated on steep-sided maritime cliffs. Nationally scarce rock whitebeam is found within the partially vegetated cliffs. The ground flora is diverse and indicative of undisturbed woodland. The woodland is rich in bryophytes and lichens, including the nationally scarce lichen *Usnea wasmuthii*, and nationally scarce fungus that grows on lichens – *Sphinctrina turbinata*.	0.3km south west
Southannan Sands	SSSI	NS 18300 52300	One of the best examples of intertidal sandflats habitat within the coastal cell covering the Clyde coastline. The sandflats are mainly composed of fine to medium sheltered sands, with a small area of mud/silt at Fairlie Sands. Extensive areas of nationally scarce dwarf eelgrass (*Zostera noltei*) are a biologically and structurally important component.	0.17km north
Kames Bay	SSSI	NS 1711 5509	Kames Bay is an important educational research site for the study of inter-tidal marine biology.	2.1km north-west
Ballochmartin Bay	SSSI	NS 1818 5680	The most varied section of coast on Great Cumbrae. An important research site, the beach is backed by herb-rich grassland and roadside verges supporting slow worms (*Anguis fragilis*) and a number of uncommon higher plant species.	3.5km north

[16] A number of LNCS are categorised as SWT Wildlife Sites (or SWT Provisional Wildlife Sites). However, SWT no longer recognise these as SWT Wildlife Sites (*Scottish Wildlife Trust pers. comm. 27/11/19*) and this dataset is in the process of being updated (*North Ayrshire Council (Thom Ledingham) pers. comm. 27/11/19*).

Site	Designation	Grid Reference	Summary reasons for designation	Proximity to the Site (Approx.)
NON-STATUTORY SITES (Including AWI sites)				
Goldenberry Hill	LNCS	NS 18500 50800	Currently unavailable*	0.25km south
Cambelton Hill and Watermeadow	LNCS	NS 19120 50740	Currently unavailable*	0.5km south-east
Ardneil Bank Wood and Southbanks, Portencross	LNCS	NS 17805 49095	Currently unavailable*	1.75km south
Glen Burn (Crosbie to North Southannan)	LNCS	NS 20863 51919	Currently unavailable*	2km east
Seamill to Ardneil Bay	LNCS	NS 18665 48404	Currently unavailable*	2.3km south
Portencross Woods	LNCS (AWI)	NS 17800 49500	Ancient Woodland (semi-natural origin)	0.1km south-west
Goldenberry Hill	LNCS (AWI)	NS 18500 50800	Long established woodland (plantation origin)	0.2km south
Campbelton Wood	LNCS (AWI)	NS 19000 50900	Long established woodland (plantation origin)	0.36km south-east
Hunterston House Wood	LNCS (AWI)	NS 19400 51800	Long established woodland (plantation origin)	0.5km east
Thicket Plantation	LNCS (AWI)	NS 18300 49600	Long established woodland (plantation origin)	1.4km south
Kilruskin Wood	LNCS (AWI)	NS 20228 51793	Long established woodland (plantation origin)	1.5km east
Ardneil Bank Wood	LNCS (AWI)	NS 17700 49100	Long established woodland (plantation origin)	1.9km south-west
Carlung Wood	LNCS (AWI)	NS 19500 48900	Long established woodland (plantation origin)	2km south-east
Kilruskin Glen	LNCS (AWI)	NS 21000 51100	Long established woodland (plantation origin)	2km east
The Glen	LNCS (AWI)	NS 20700 52600	Ancient Woodland (semi natural origin)	2.1km north-east
Allan Wood	LNCS (AWI)	NS 20800 53100	Ancient Woodland (semi natural origin)	2.25km north-east
Ardneil, Portencross	LNCS (AWI)	NS 18740 48580	Ancient woodland (semi-natural origin)	2.25km south
Dykes Plantation	LNCS (AWI)	NS 21600 50900	Long established woodland (plantation origin)	2.7km east
The Avenue	LNCS (AWI)	NS 21300 49700	Long established woodland (plantation origin)	2.9km south-east
Southannan	LNCS (AWI)	NS 20800 53900	Other – mixed deciduous and coniferous mature woodland	3.1km north-east

* The reasons for designation of five of the LNCS are 'currently unavailable'. SWT no longer recognises these sites as SWT Wildlife Sites (*Scottish Wildlife Trust pers. comm. 27/11/19*) and this dataset is in the process of being updated (*North Ayrshire Council (Thom Ledingham) pers. comm. 27/11/19*). The available information on these sites is in **DRAFT** status only (**Appendix B**) and should not be relied upon to inform the EIA in the absence of further consultation with North Ayrshire Council.

3.2 Important habitats

AWI sites are included in the list of non-statutory biodiversity sites (Section 3.1). No additional information on the distribution of important habitats within 3km of the Site was available.

3.3 Legally protected and important species

Records held by SWSEIC

SWSEIC hold a total of 281 records of legally protected species and/or other important species within 3km of the site, within the past 10 years. The results are summarised in **Table 3.2**. SWSEIC do not hold records of any bat roosts within 5km of the site. Bat roosts recorded as part of monitoring to inform the Hunterston Annual Land Management Reviews are summarised in the section below. Further details of bat roosts are also included in a separate report (*Hunterston B Decommissioning EIA – Baseline Report: Bats*).

Table 3.2 Records of legally protected and other important species

Common	Scientific name	Records	Most recent record	Legal / priority status
Terrestrial Mammal				
Otter	*Lutra lutra*	1	2015	EPS; SBL; LBAP
Badger	*Meles meles*	1	2015	Protection of Badger Act 1992
Brown hare	*Lepus europaeus*	6	2016	SBL
Common Pipistrelle	*Pipistrellus pipistrellus*	3	2016	W&C; EPS; SBL; LBAP
Soprano pipistrelle bat	*Pipistrellus pygmaeus*	2	2016	W&C; EPS; SBL; LBAP
Brown Long-eared Bat	*Plecotus auritus*	1	2016	W&C; EPS; SBL
Myotis bat species	*Myotis sp.*	1	2016	W&C; EPS; SBL
Marine mammal				
Common seal	*Phoca vitulina*	3	2012	SBL, Marine (Scotland) Act 2010
Common porpoise	*Phocoena phocoena*	2	2012	SBL; EPS
Birds				
Arctic Tern	*Sterna paradisaea*	1	2009	SBL
Barn Owl	*Tyto alba*	4	2010	WCA(Sch1); SBL
Barnacle goose	*Branta leucopsis*	2	2017	SBL
Bar-tailed godwit	*Limosa lapponica*	23	2015	SBL
Black-headed gull	*Chroicocephalus ridibundus*	90	2015	SBL
Black-throated diver	*Gavia arctica*	4	2010	WCA(Sch1); SBL
Bullfinch	*Pyrrhula pyrrhula*	19	2015	SBL

Common	Scientific name	Records	Most recent record	Legal / priority status
Common crossbill	*Loxia curvirostra*	2	2010	WCA(Sch1)
Common tern	*Sterna hirundo*	4	2010	SBL
Curlew	*Numenius arquata*	105	2015	SBL; BoCC (red)
Dunlin	*Calidris alpina*	19	2015	SBL
Dunnock	*Prunella modularis*	104	2015	SBL
Golden plover	*Pluvialis apricaria*	7	2010	SBL
Goldeneye	*Bucephala clangula*	3	2017	WCA(Sch1)
Grasshopper warbler	*Locustella naevia*	11	2012	SBL; BoCC (red)
Greenland greater white fronted goose	*Anser albifrons subsp. flavirostris*	2	2011	SBL
Greenshank	*Tringa nebularia*	24	2015	WCA(Sch1)
Grey Partridge	*Perdix perdix*	5	2009	SBL; BoCC (red); LBAP
Grey Wagtail	*Motacilla cinerea*	16	2015	BoCC (red)
Herring gull	*Larus argentatus*	115	2015	SBL; BoCC (red)
Hooded crow	*Corvus cornix*	38	2015	SBL
House sparrow	*Passer domesticus*	115	2015	SBL; BoCC (red)
Kestrel	*Falco tinnunculus*	17	2014	SBL
Kingfisher	*Alcedo atthis*	4	2010	WCA(Sch1); SBL
Kittiwake	*Rissa tridactyla*	5	2013	BoCC (red)
Lapwing	*Vanellus vanellus*	28	2015	SBL; BoCC (red)
Lesser redpoll	*Acanthis cabaret*	15	2014	SBL; BoCC (red)
Linnet	*Linaria cannabina*	18	2015	SBL; BoCC (red); LBAP
Merlin	*Falco columbarius*	5	2011	WCA(Sch1); SBL; BoCC (red)
Mistle thrush	*Turdus viscivorus*	41	2015	BoCC (red)
Pied flycatcher	*Ficedula hypoleuca*	1	2009	BoCC (red)
Puffin	*Fratercula arctica*	3	2011	BoCC (red)
Red-throated diver	*Gavia stellata*	10	2015	WCA(Sch1); SBL
Reed bunting	*Emberiza schoeniclus*	17	2011	SBL; LBAP
Ringed plover	*Charadrius hiaticula*	28	2015	BoCC (red)

Common	Scientific name	Records	Most recent record	Legal / priority status
Sandwich tern	*Sterna sandvicensis*	20	2015	SBL
Shag	*Phalacrocorax aristotelis*	65	2015	BoCC (red)
Siskin	*Spinus spinus*	31	2015	SBL
Skylark	*Alauda arvensis*	20	2015	SBL; BoCC (red); LBAP
Song thrush	*Turdus philomelos*	53	2015	SBL; BoCC (red); LBAP
Spotted flycatcher	*Muscicapa striata*	10	2012	SBL; BoCC (red); LBAP
Starling	*Sturnus vulgaris*	117	2015	SBL; BoCC (red)
Swift	*Apus apus*	20	2014	SBL
Twite	*Linaria flavirostris*	11	2014	SBL; BoCC (red)
Whinchat	*Saxicola rubetra*	1	2011	BoCC (red)
Wood warbler	*Phylloscopus sibilatrix*	5	2014	SBL; BoCC (red)
Woodcock	*Scolopax rusticola*	6	2011	SBL; BoCC (red)
Yellowhammer	*Emberiza citrinella*	8	2015	SBL; BoCC (red)
Amphibians				
Common Toad	*Bufo bufo*	3	2016	SBL
Reptiles				
Common lizard	*Zootoca vivipara*	4	2012	W&C; SBL
Invertebrates				
Small heath	*Coenonympha pamphilus*	5	2013	SBL
Grayling	*Hipparchia semele*	17	2016	SBL
Shaded Boar-bar	*Scotopteryx chenopodiata*	4	2016	SBL
Latticed heath	*Chiasmia clathrata*	1	2016	SBL
White Ermine	*Spilosoma lubricipeda*	1	2016	SBL
Garden tiger	*Arctia caja*	1	2016	SBL
Cinnabar	*Tyria jacobaeae*	5	2016	SBL
Ear moth	*Amphipoea oculea*	1	2016	SBL
Red mason bee	*Osima rufa*	2	2018	SBL

Common	Scientific name	Records	Most recent record	Legal / priority status
Flowering Plants				
Bluebell	*Hyacinthoides non-scripta*	3	2018	WCA
Non-native invasive species				
Japanese knotweed	*Fallopia japonica*	3	2016	WCA(Sch9)

EPS –European Protected Species are protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the Habitats Regulations)

W&C - included on Schedule 5 or 8 of the Wildlife and Countryside Act 1981 (as amended)

SBL – Scottish Biodiversity List;

WCA(Sch1) – Bird species listed on schedules 1, 1A or A1 of the Wildlife & Countryside Act 1981 (as amended in Scotland);

BoCC (red) – Birds of Conservation Concern (BoCC) Red List (Eaton et al 2015).

WCA(Sch9) – Non-native species listed in Schedule 9 (parts 1 and 2) of the Wildlife and Countryside Act 1981 (as amended) and includes animals and plants which may not be released or allowed to escape into the wild.

LBAP – North Ayrshire Biodiversity Action Plan species

RDB - Red Data Book species.

Species reported in ILMPs and LMARs

Species records within the HNB estate detailed in the ILMP and LMARs are briefly summarised in **Table 3.3**.

Table 3.3 Summary of species surveys/records from ILMPs and LMARs

Species/Group	Year	Key findings
Breeding birds	2003, 2006, 2011, 2015, 2017	Notable species (Red or Amber list of birds of conservation concern and/or on the Scottish Biodiversity List) recorded include linnet, starling, song thrush, mistle thrush, spotted flycatcher, reed bunting, dunnock, meadow pipit, willow warbler, grasshopper warbler, bullfinch, lapwing, mallard and oystercatcher.
Wintering birds	2014/15; and 2016/17	Peregrine (*Falco peregrinus)* and hen harrier (*Circus cyaneus)*; regionally important numbers of linnet; locally important population of twite, Species recorded on the intertidal mud/sand in exceedance of 1% of regional population: shelduck (*Tadorna tadorna)*, mallard (*Anas platyrhynchos)*, curlew, oystercatcher (*Haematopus ostralegus)*, common gull (*Larus canus)*. Locally important numbers of black guillemot (*Cepphus grylle)*, turnstone (*Arenaria interpres)*, black-headed gull and herring gull. Other notable species include woodcock, snipe (*Gallinago gallinago)*, fieldfare (*Turdus pilaris)*, black-throated diver, skylark, meadow pipit (*Anthus pratensis)*, lesser redpoll, Eider (*Somateria mollissima)*, kittiwake, redshank (*Tringa totanus)*, redwing (*Turdus iliacus),* ringed plover
Bats	2015, 2016, 2017, 2018	Inspections of bat boxes around the Hunterston estate recorded roosting bats, including but not necessarily limited to soprano pipistrelle and common pipistrelle)
Badger	2011	Survey of Hunterston estate did not record badger. Single entrance sett previously recorded at the edge of the nearby converter station and substation.
Otter	2012, 2016	Survey of Hunterston estate (2012) did not record otter. Dead otter reported on the access road (2016).
Invertebrates	2014, 2015, 2016, 2017, 2018	Surveys have generally recorded butterfly and moth species that are common to Ayrshire, with a small number of more notable/uncommon moth species and also small heath (*Coenonympha pamphilus)*, which is a Scottish Biodiversity List (SBL) species.

Species/Group	Year	Key findings
Other incidental records	-	Osprey (*Pandion haliaetus)*, teal (*Anas crecca)*, little egret, brown hare, European eel (*Anguilla anguilla), brown/sea trout (Salmo trutta), Agriphila latistria*, (a grass moth - new Ayrshire record), Brussels lace (*Cleorodes lichenaria* - first record for North Ayrshire) Two Invasive non-native species: Himalayan Balsam (*Impatiens glandulifera*) and *Rhododendron ponticum; and* Sea buckthorn (*Hippophae rhamnoides*), a native, invasive species.

Appendix A
Figures

Appendix B
Information on LNCS (DRAFT)

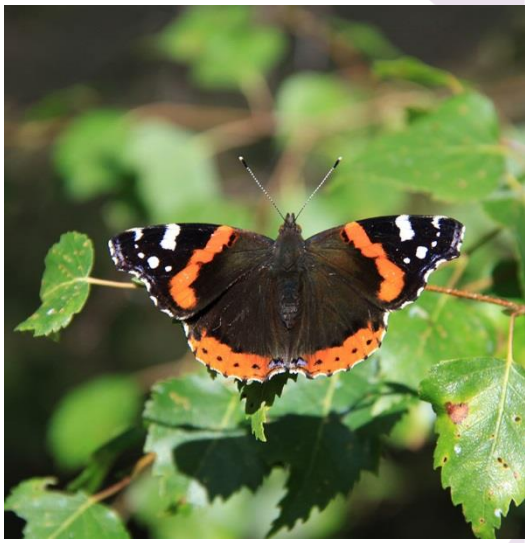
Appendix 8B: Baseline Report: Phase 1 Habitat Survey

November 2023

EDF Energy

Hunterston B Decommissioning EIA

Baseline Report: Phase 1 Habitat Survey



Wood Environment & Infrastructure Solutions UK Limited – December 2019

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Document revisions

No.	Details	Date
1	Draft for client comment	October 2019
2	Final	December 2019

Contents

1. Introduction

1.1 Purpose of this report

EDF Energy proposes to start preparation for waste processing facilities (Operational and Decommissioning Waste) and waste stores (ILW Store) at Hunterston B (HNB) to support decommissioning activities following the End of Generation (EoG), which is currently scheduled to be in 2023. Prior to the construction of these facilities, planning permission from the Local Planning Authority (LPA) under The Town and Country Planning (Scotland) Act 1997 (TCPSA) will be required. Other permissions and consents for the overall decommissioning project will be required separately under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning (EIAD)) Regulations, 1999 as amended and EURATOM Article 37 (or an equivalent).

The current strategy is for an EIA to be undertaken and a single Environmental Statement (ES) to be prepared to assess the environmental impacts of the proposed decommissioning project under both the TCPSA and EIAD Regulations. Other consents for specific activities will also be required and can draw on the EIAs.

This report sets out information about the Phase 1 habitat survey that was undertaken to inform the EIA of the HNB Decommissioning Project. It includes a brief description of the proposed HNB Decommissioning Project before setting out information about the Phase 1 habitat survey methods, results and conclusions.

1.2 Scheme description

Decommissioning of the Site is expected to commence in 2023. The site location is shown on **Figure 1.1, Appendix A**. Once the necessary consent is in place, the decommissioning process will begin with the process of defueling and initial decommissioning, with spent fuel transferred to the Sellafield nuclear licensed site. Over approximately a 15-year period there will be a process of safe storage and management of intermediate and low-level waste, with intermediate level waste stored temporarily on or near the site, in sealed and shielded containers within designed stores that have similar characteristics to industrial units, and low-level waste being transferred to appropriate treatment or disposal facilities. In parallel with these tasks, redundant buildings will be de-planted and demolished.

This initial decommissioning phase will include construction of waste processing facilities and a secure, weathertight, Safestore structure – a clad, steel framed structure based around the reactor building – will be constructed, to enclose the Advanced Gas-cooled Reactors, allowing the process of radioactive decay to reduce dose to significantly lower levels. The second phase of decommissioning – Care & Maintenance – will involve ongoing site/station care and maintenance over a period of approximately 70 years. The third phase will involve reactor building decommissioning and final site clearance involving site-wide demolition of the remaining buildings and remediation to an extent conforming to the applicable regulations at the time, followed by back-filling. Aside from the defueling and management of waste storage and decay processes, the Site will operate similar to a conventional construction/demolition site.

1.3 Site context

The HNB site ('The Site' or 'the Station') is in North Ayrshire, approximately 9km south of Largs and 4km north-west of West Kilbride, on the Firth of Clyde coast. The centre of the Site is situated at Ordnance Survey (OS) Grid Reference NS 18400 51400, and the Nuclear Site Licence (NSL) boundary extends to approximately 30ha. Much of the Site is comprised of built structures and hard standing (predominantly access routes and car parks). Hunterston A (HNA) is situated to the west of, and immediately adjacent, to HNB.

2. Methodology

2.1 Study Area

The Site includes the land inside the HNB double security fence and the land that is covered by the HNB Nuclear Site Licence (NSL). The Study Area includes the Site and a 100m (approximately) perimeter area.

2.2 Desk Study

A desk-based study was undertaken to collate and review existing information on ecological features that are known to occur, or have previously been recorded, on land within and surrounding the Study Area defined in Section 2.1. These features include sites designated for nature conservation; habitats of importance for nature conservation; and legally protected and/or otherwise important species. The desk study is detailed in a separate report (*Hunterston B Decommissioning – Baseline Report: Desk Study [Terrestrial Ecology*]).

Data collected from the South West Scotland Environmental Information Centre (SWSEIC), formally Dumfries and Galloway Environmental Records Centre, includes details of species (including plants) recorded within approximately 3 km of the Site. The Hunterston B Land Management Annual Reviews[1] (LMAR) and Hunterston Integrated Land Management Plan[2] (ILMP) also include details of species (including plants) recorded within the Study Area.

2.3 Phase 1 habitat survey

Data collection locations and survey objectives

The Phase 1 habitat survey covered the land within the Study Area as defined in **Section 2.1.** The purpose of the Phase 1 habitat survey was to map the extent of different habitat types within the Study Area and identify areas of habitat that are potentially of notable biodiversity conservation value. This survey has been completed to collect information on the baseline status of habitats within the Study Area against which the predicted effects of the HNB Decommissioning Project will be assessed. The Phase 1 habitat survey also informed the scope of more detailed surveys at the HNB site, including faunal surveys.

Data collection methods

The Phase 1 habitat survey was completed in accordance with good practice, whereby distinct habitat types were identified and mapped, applying standard habitat definitions (JNCC 2010[3]). The optimal survey period is between late April and mid-October i.e. during the main period of vegetation growth, which is when different habitat types can be most accurately identified based on their component plant species. The survey was undertaken in June 2019, during this optimal survey period.

As part of the Phase 1 habitat survey method, Target Notes (TNs) are used to record the location and description (e.g. species composition and structure) of habitats of potentially notable nature conservation value and habitats that are restricted to small areas that could not be mapped accurately, as well as habitat mosaics or areas of transition between different habitat types. Target Notes are also used to record non-

[1] EDF Energy Nuclear Generation Ltd (2013 to 2018). Hunterston B Land Management Annual Review
[2] EDF Energy Nuclear Generation Ltd (2017) Hunterston Integrated Land Management Plan.
[3] Joint Nature Conservation Committee (2010). *Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit*. JNCC, Peterborough.

native, invasive plant species[4]. Habitats or species that are of Principal Importance for the Conservation of Biodiversity in Scotland, listed on the Scottish Biodiversity List (SBL) [5], are also recorded, along with other species of notable nature conservation importance, such as Red Data Book/Red List species.

2.4 Constraints

Part of the Study Area is situated on land within Hunterston A Power Station, which was inaccessible during the survey. The habitats within this part of the Study Area were recorded/mapped using binoculars. This is appropriate as this area is predominantly hard standing and buildings, with limited/localised areas of vegetation around perimeter areas, including amenity grassland, plantation and tall ruderal vegetation, which can be identified without closer inspection.

[4] Section 14C of the Wildlife and Countryside Act 1981 (as amended in Scotland) makes it an offence to plant or otherwise cause to grow any plant out-with its native range. Guidance on non-native species is set out in: Scottish Government (2012). Code of Practice on Non-Native Species - Made by Scottish Ministers under section 14C of the Wildlife and Countryside Act 1981 (https://www2.gov.scot/Resource/0039/00398608.pdf.).

[5] The Scottish Biodiversity List is a list of plants, animals and habitats that Scottish Ministers consider to be of principal importance to biological conservation. https://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL

3. Results

3.1 Desk Study

The desk study identified areas of Ancient Woodland within 3km of the Site, the closest being Portencross Woods, approximately 0.1km to the south-west. The South West Scotland Environmental Information Centre (SWEIC) hold a record Japanese knotweed (*Fallopia japonica*), an invasive non-native species, within 3km of the Site. The HNB ILMP and LMAR report include records of Himalayan Balsam (*Impatiens glandulifera*) and *Rhododendron ponticum*, also invasive non-native species, within areas surrounding the HNB Station. The desk study is detailed in a separate report (*Hunterston B Decommissioning – Baseline Report: Desk Study [Terrestrial Ecology*]). The HNB ILMP and LMAR also report that Sea buckthorn (*Hippophae rhamnoides*), a native species, is subject to control measures to restrict its spread into areas of coastal grassland.

3.2 Phase 1 habitat survey

The habitats within the Study Area are mapped on **Figure 3.1, Appendix A**. The accompanying/numbered Target Notes (TN) are included in **Appendix B**, with the corresponding locations mapped on **Figure 3.1.** The land within the HNB double security fence is predominantly hard standing, including buildings and roads associated with the operational station, with the vegetation in this area mainly comprising amenity grassland. The coast is immediately to the west of the Site and there are areas of predominantly improved grassland to the north, with poor-semi-improved grassland to the east and south. No non-native invasive plant species were recorded.

Broadleaved plantation woodland

Broadleaved plantation woodland is present to the south of the site, within the NSL boundary. Some stands (e.g. TN 1, **Figure 3.1** and **Appendix B**) comprise a mix of semi-mature ash (*Fraxinus excelsior*), sycamore (*Acer Pseudoplatanus*), hawthorn (*Crataegus monogyna*), horse chestnut *(Aesculus hippocastanum*), and rowan (*Sorbus aucuparia*), while others (e.g. TN 2) are composed of beech (*Fagus sylvatica*) and more mature sycamore.

Mixed plantation woodland

Small stands of mixed plantation woodland are present to the south of the site, within the NSL boundary. One stand (TN 4, **Figure 3.1** and **Appendix B**) comprises mature ash, sycamore, Sitka spruce (*Picea sitchensis*) and alder (*Alnus glutionosa*), while the other (TN 5) comprises mature sycamore, beech and Scots pine (*Pinus sylvestris*) with scattered gorse (*Ulex europaeus*) and bramble (*Rubus fruticosus*).

Parkland and scattered trees

Scattered broadleaved and coniferous trees are present both within and outside of the double security fence and NSL boundary (TN 7 - TN 10, **Figure 3.1** and **Appendix B**). A small, dense, stand of cedar (Cedrus spp.) trees (TN 11) is located within the northern part of the Site.

Semi-improved neutral grassland

A narrow band of semi-improved neutral grassland (TN 12, **Figure 3.1** and **Appendix B**) is present near the coastline to the north-west of study area, outside of the double security fence and NSL boundary. This habitat comprises a variety of species including false oat-grass (*Arrhenatherum elatius*), ribwort plantain (*Plantago lanceolata*), common bird's-foot trefoil (*Lotus corniculatus*), black medic (*Medicago lupulina*), thistle

(Cirsium sp.), nettle (*Urtica dioica*), yarrow (Achillea millefolium), sea radish (*Raphanus maritimus*), and occasional cock's-foot (*Dactylis glomerata*), reflecting the low intensity of management in this area. Stems of yellow iris (*Iris pseudacorus*) also occur locally in damper hollows within the grassland.

Improved grassland

Agricultural fields to the north of the double security fence and NSL boundary are predominantly improved grassland which is subject to grazing by sheep (TN 13, **Figure 3.1** and **Appendix B**). This habitat is characterised by the presence of white clover (*Trifolium repens*), perennial rye-grass (*Lolium perenne*), crested dogs-tail (*Cynosurus cristatus*), and daisy (*Bellis perennis*), with thistle present along field margins.

Marshy Grassland

Marshy grassland (TN 14, **Figure 3.1** and **Appendix B**) is present along the edge of a field drain situated outside of the double security fence and NSL boundary, to the south-east of the study area. This habitat comprises soft rush (*Juncus effusus*), yellow flag iris, silverweed (*Potentilla anserina*), water mint (*Mentha aquatica*), and dock (Rumex sp.). Another area of marshy grassland (TN 15) comprises soft rush, with a mixture of thistle, buttercup (Ranunculus sp.), rosebay willowherb (*Chamerion angustifolium*) and common ragwort *(Senecio Jacobaea*).

Poor semi-improved grassland

This habitat covers several areas to the south and west of the study area, outside the NSL boundary, often where land has been subject to ground disturbance. To the south-east of the NSL boundary (e.g. TN 16) the vegetation within this community comprises an abundance of Yorkshire fog (*Holcus lanatus*) and meadow grass (Poa sp.), with scattered black medic, common bird's-foot trefoil, and occasional dock. In other areas, thistle, nettle, soft rush, buttercup and sweet vernal-grass (*Anthoxanthum odoratum*) also frequently occur.

Tall ruderal

Tall ruderal vegetation, dominated by rosebay willowherb and bramble, is present within the NSL boundary to the east of the site (TN 19 and 20, **Figure 3.1** and **Appendix B**).

Running water

A single watercourse, in the form of a field drain (TN 14), is present to the south-east of the study area, outside the NSL boundary. Sea water enters a large cylindrical tank close to the northern edge of the double security fence (south of TN18). The Firth of Clyde is outside the NSL boundary to the west of the study area.

Shingle and boulders (above high-tide mark)

Shingle and gravel forms part of the coastline in the north-west of the study area, within which occasional scattered plants such as sea sandwort (*Honkenya peploides*) and orache (Atriplex sp.) species occur. Larger boulders are also present within this area, positioned for sea defence purposes.

Dune Scrub

Within the north-west of the study area, outside the double security fence and NSL boundary, the mixture of sea buckthorn and bramble is characteristic of dune scrub (TN 37).

Amenity grassland

Amenity grassland (e.g. TN 22) is the most common habitat within the double security fence. In places this grassland includes daisy, greater plantain (*Plantago major*), nettle and dock.

Ephemeral/ short perennial grassland

Ephemeral/short perennial grassland (e.g. TNs 24-30, **Figure 3.1** and **Appendix B**) is present both inside and outside the double security fence and NSL boundary, typically in areas of land with shallow stony soil that have been subject to disturbance. This vegetation predominantly comprises low-growing species, dominated by white clover and creeping buttercup (*Ranunculus repens*), with frequent greater plantain and occasional black medic, Yorkshire fog, soft rush and thistles.

Introduced shrub

Areas of planted and managed introduced shrub (TNs 31 and 32, **Figure 3.1** and **Appendix B**) are present inside the double security fence and NSL boundary and include species such as Rhododendron sp. barberry (Berberis sp.), sea buckthorn, beach rose (*Rosa rugosa*), cedar and Hydrangea sp.

Hedgerow

An intact hedgerow (TN 34, **Figure 3.1** and **Appendix B**) with blackthorn (*Prunus spinosa*), dog rose (*Rosa canina*), and hazel (*Corylus sp.*) is situated within the north-east of the study area, outside the double security fence and NSL boundary. Hedgerows are a SBL habitat of Principal Importance for biodiversity conservation.

Buildings

There are numerous buildings, including pumphouses, offices, portacabins, reactor buildings, storage facilities and workshops, within the double security fence and NSL boundary.

4. Summary

4.1 Current baseline

Habitats within the HNB double security fence

The habitats within the HNB double security fence predominantly comprise hard standing and buildings, amenity grassland and poor semi-improved grassland, with bordering areas of broadleaved woodland plantation, scattered broadleaved trees, and patches of tall ruderal vegetation. The habitats inside the security fence are likely to be of limited biodiversity conservation value.

Habitats outside the HNB double security fence

The habitats within the Study Area, outside the HNB double security fence, predominantly comprise improved grassland and poor semi-improved grassland. These habitats are typically of limited biodiversity conservation value. There is a hedgerow, a habitat type that is of Principal Importance for the conservation of Biodiversity, to the north-east of the double security fence and NSL boundary.

Appendix A
Figures

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218000

218500

651500

651000

HUNTERSTON 'A'

Hunterston Nuclear Generating Station

Stoney Port

Hillhouse

Pond

Ponds

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 100m
- Broadleaved woodland - plantation
- Mixed woodland - plantation
- Scrub - dense/continuous
- Scrub - scattered
- Neutral grassland - semi-improved
- Improved grassland
- Poor semi-improved grassland
- Marsh/marshy grassland
- Tall ruderal
- Running water
- Shingle/gravel above high-tide mark
- Rocks/boulders above high-tide mark
- Dune scrub
- Amenity grassland
- Ephemeral/short perennial
- Introduced shrub
- Buildings
- Bare ground
- Other habitat
- Hardstanding
- Running water
- Intact hedgerow
- Fence
- Boundary removed
- Parkland and scattered trees- broad-leaved
- Parkland and scattered trees - coniferous
- Target note

0 50 100 150 200 m

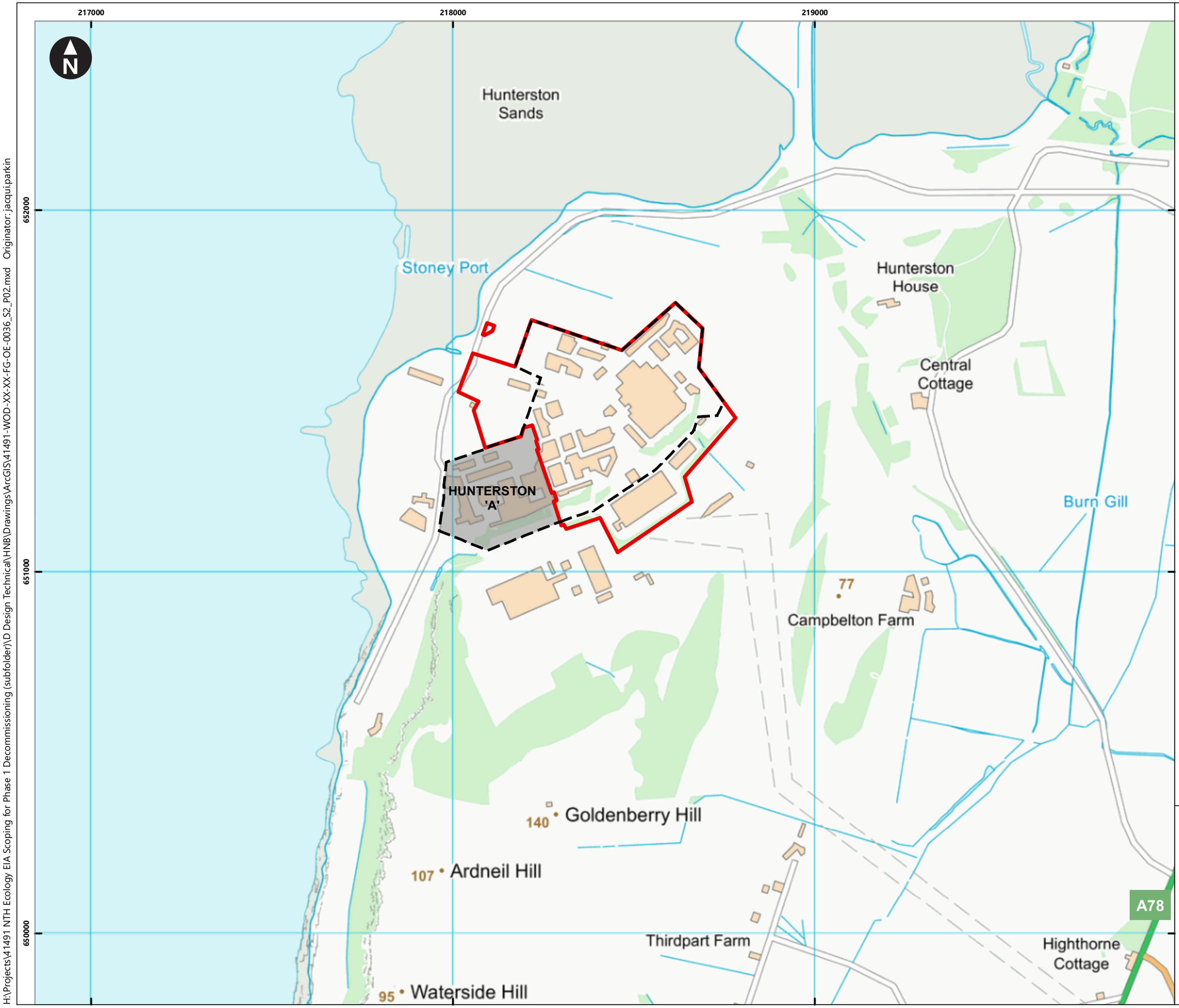
Scale at A3: 1:4,000

Hunterston B Decommissioning EIA
Baseline Report: Phase 1 Habitat Survey

Figure 3.1
Phase 1 habitat map

November 2019

wood.



Key

Hunterston B Nuclear Site Licence boundary

Double security fence

0 100 200 300 400 500 600 m

Scale at A3: 1:10,000

Hunterston B Decommissioning EIA
Baseline Report: Phase 1 Habitat Survey

Figure 1.1
Site location plan

November 2019

wood.

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Appendix B
Phase 1 habitat survey - Target Notes

Target Note (TN) marked on Figure 3.1	Description
1	Broadleaved plantation woodland, including ash, sycamore, hawthorn, horse chestnut and rowan, with scattered gorse. A patch of rhododendron near the base of the slope.
2	Mature broadleaved plantation woodland - almost entirely sycamore with some beech.
3	Broadleaved plantation woodland with ash, sycamore, hawthorn and elder.
4	Mixed plantation woodland comprising alder, ash, sycamore and Sitka spruce.
5	Mature mixed plantation with Scot's pine, sycamore and beech. Scattered gorse and bramble throughout.
6	Broadleaved parkland trees (approximately 8m-10m tall).
7	Broadleaved trees, including sycamore and willow.
8	Scattered broadleaved tree species next to hedgerow.
9	Small stand of broadleaved trees, mainly sycamore with some elder and hawthorn.
10	Mixed scattered trees (approximately 4-9m tall), including pine (Pinus sp.), sycamore, and cherry (Prunus sp.).
11	Stand of semi-mature cedar trees.
12	Roadside vegetation comprises frequent plantain (Plantago sp.), false oat-grass, bird's foot trefoil, black medic, thistle, nettle, yarrow, sea radish and occasional cock's-foot.
13	Grassland (livestock grazing) with frequent meadow grass (Poa sp.), crested dog's tail, creeping buttercup, perennial rye-grass, Yorkshire fog, daisy and common mouse ear (*Cerastium fontanum*), and thistle around the perimeter.
14	Marsh vegetation within and around a wet ditch - yellow flag iris, soft rush, silverweed, dock and water mint.
15	Soft rush, marsh thistle (*Cirsium palustre*), creeping buttercup, rosebay willowherb and ragwort.
16	Area has been subject to disturbance (construction works). Vegetation comprises Yorkshire fog, sweet vernal-grass, meadow grass, sorrel (Rumex sp.), dandelion (Taraxacum agg.), germander speedwell (*Veronica chamaedrys*) and occasional nettle.
17	Ground has been disturbed previously and includes soft rush, creeping buttercup, Yorkshire fog, sweet vernal-grass, thistle and nettles.
18	Soil mound/ bank around the perimeter of site which is overgrown with Yorkshire fog and meadow grass species. Broadleaved dock and thistle are frequent.
19	Overgrown with bramble, thistle, ferns, rosebay willowherb and nettles.
20	Overgrown with rosebay willowherb and bramble, with abundant red campion (*Silene dioica*), and scattered sycamore and elder (*Sambucus nigra*) saplings.
21	Mapped as tall ruderal vegetation due to density of dock and thistle, with grassland areas (white clover, meadow grass, curled dock (*Rumex crispus*), broadleaved dock (*Rumex obtusifolius*), Plantago sp., creeping buttercup and silverweed).

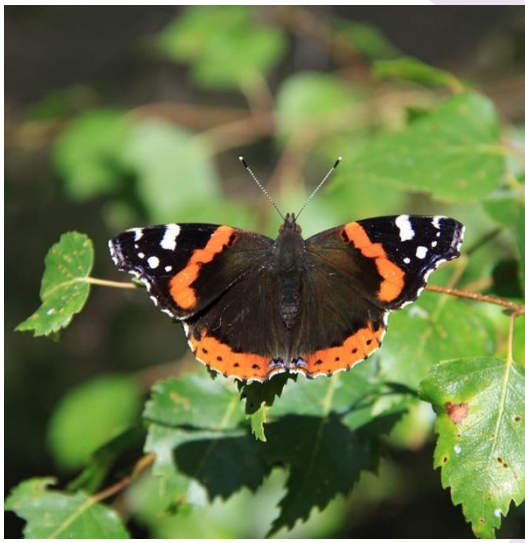
Target Note (TN) marked on Figure 3.1	Description
22	Amenity grassland, in places with daisy, greater plantain, nettle and dock.
23	Short, unmown grass with abundant white clover, frequent common mouse ear, creeping buttercup and dock.
24	Shallow stony soil with short vegetation dominated by buttercup and white clover. Thistle and Plantago sp. are frequent.
25	Slope supporting white clover and buttercup, with Yorkshire fog, thistle, occasional black medic and soft rush.
26	Short grassland supporting white clover, creeping buttercup, with occasional silverweed, Plantago sp., thistle and rosebay willowherb.
27	Grassland with abundant creeping buttercup, white clover, Plantago sp., thistle and dock, with frequent selfheal (*Prunella vulgaris*) and germander speedwell. Patches of bare ground.
28	Formally bare ground, with vegetation starting to regenerate e.g. creeping buttercup, dock and thistle.
29	Vegetation on stony, previously disturbed, ground, comprising abundant white clover, creeping buttercup; frequent Plantago sp., black medic, common bird's-foot trefoil, and Yorkshire fog; occasional perennial rye-grass and thistle.
30	Grassland with abundant buttercup, white clover, and thistle; frequent ribwort plantain, rosebay willowherb, common bird's-foot trefoil, dock, silverweed, occasional marsh orchid (Dactylorhiza sp.) and bramble around the perimeter.
31	Planted shrub beds with scattered sycamore and conifer trees.
32	Introduced shrubs - rhododendron sp., hydrangea sp., barberry sp., beach rose, sea buckthorn, cedar and sycamore.
33	Hedge on the northern side of a building, comprising a variety of species. Suitable habitat for nesting birds.
34	Intact hedgerow with hazel, blackthorn and dog rose.
35	Earth bank overgrown with scrub such as birch (Betula sp.), redcurrant (Ribes sp.) and dog rose, with some broom (*Cytisus scoparius*).
36	Roadside vegetation to the north of a track: abundant reed canary-grass (*Phallaris arundinacea*), curled dock, horsetail (Equisetum sp.), butterbur (*Petacites hybridus*), nettle, red clover (*Trifolium pratense*), black medic, vetch (Vicia sp.) and thistle.
37	Dense stand of sea buckthorn and bramble.
38	Ribwort plantain, common bird's-foot trefoil, marsh orchid, creeping buttercup, thistle, dock, and sedge (Carex sp.)
39	Hardstanding.

Appendix 8C: Baseline Report Otter

EDF Energy

Hunterston B Decommissioning EIA

Baseline Report: Otter



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Document revisions

No.	Details	Date
1	Draft	September 2019
2	Final	December 2019

Contents

1. Introduction

1.1 Purpose of this report

EDF Energy propose to start preparation for waste processing facilities (Operational and Decommissioning Waste) and waste stores (ILW Store) at Hunterston B (HNB) to support decommissioning activities following the End of Generation (EoG), which is currently scheduled to be in 2023. Prior to the construction of these facilities, planning permission from the Local Planning Authority (LPA) under Town and Country Planning (Scotland) Act 1997 (TCPA) will be required. Other permissions and consents for the overall decommissioning project will be required separately under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning (EIAD)) Regulations, 1999, as amended, and EURATOM Article 37 (or an equivalent).

The current strategy is for an EIA to be undertaken and a single Environmental Statement (ES) to be prepared to assess the environmental impacts of the proposed decommissioning project under both the TCPA and EIAD Regulations. Other consents for specific activities will also be required and can draw on the EIAs.

This report sets out information about the otter (*Lutra lutra*) survey undertaken to inform the Environmental Impact Assessment (EIA) of the HNB Decommissioning Project. It includes a brief description of the proposed HNB Decommissioning Project before setting out information about the otter survey methods, results and conclusions.

1.2 Scheme description

Decommissioning of the Site is expected to commence in 2023. The Site location is shown in **Figure 1.1, Appendix A.** The decommissioning process will begin with the process of defueling and initial decommissioning, with spent fuel transferred to the Sellafield nuclear licensed site. Over approximately a 15-year period there will be a process of safe storage and management of intermediate and low-level waste, with intermediate level waste stored temporarily on or near the site, in sealed and shielded containers within designed stores that have similar characteristics to industrial units, and low-level waste being transferred to appropriate treatment or disposal facilities. In parallel with these tasks, redundant buildings will be de-planted and demolished.

This initial decommissioning phase will include construction of waste processing facilities and a secure, weathertight, Safestore structure – a clad, steel framed structure based around the reactor building – will be constructed, to enclose the Advanced Gas-cooled Reactors, allowing the process of radioactive decay to reduce dose to significantly lower levels. The second phase of decommissioning – Care & Maintenance - will involve ongoing site/station case and maintenance over a period of approximately 70 years. The third phase will involve reactor building decommissioning and final site clearance involving site-wide demolition of the remaining buildings and remediation to an extent conforming to the applicable regulations at the time, followed by back-filling. Aside from the defueling and management of waste storage and decay processes, the site will operate similar to a conventional construction/demolition site.

1.3 Site context

The HNB site ('The Site' or 'the Station') is in North Ayrshire, approximately 9km south of Largs and 4km north-west of West Kilbride, on the Firth of Clyde coast. The centre of the Site is situated at Ordnance Survey (OS) Grid Reference NS 18400 51400, and the Nuclear Site Licence (NSL) boundary extends to approximately 30ha. Much of the Site comprises built structures and hard standing (predominantly access routes and car parks). Hunterston A (HNA) is situated to the west of, and immediately adjacent, to HNB.

2. Methodology

2.1 Study area

The Site includes the land inside the HNB double security fence and the additional land that is covered by the HNB Nuclear Site Licence (NSL), as indicated on **Figure 1.1.** The Study Area includes all areas of potentially suitable otter habitat within the Site and a 250m perimeter area around the Site.

The Study Area exceeds, on a precautionary basis, the recommended criteria set out in the Scottish Natural Heritage (SNH) Protected Species Advice for Developers: Otter[1], which states: *'Otters occur throughout Scotland. Places where they might be present and could be disturbed by development works includes watercourses, coasts, estuaries and wetlands. Any of these habitats within 200m of the development should be surveyed for otters.'*

2.2 Desk study

A desk-based study was undertaken to collate and review existing information on ecological features that are known to occur, or have previously been recorded, on land within and surrounding the Study Area defined in Section 2.1. These features include sites designated for nature conservation; habitats of importance for nature conservation; and legally protected and/or otherwise important species (including otter). The desk study is detailed in a separate report (*Hunterston B Decommissioning – Baseline Report: Desk Study [Terrestrial Ecology*]).

Data collected from the South West Scotland Environmental Information Centre (SWSEIC), formally Dumfries and Galloway Environmental Records Centre, includes details of species (including otter) recorded within approximately 3 km of the Site. The Hunterston B Land Management Annual Reviews[2] (LMAR) and Hunterston Integrated Land Management Plan[3] (ILMP) also include details of species (including otter) recorded within the Study Area.

2.3 Otter survey

Survey objectives

Otter is a legally protected species (**Appendix B**) and a species of Principal Importance for the Conservation of Biodiversity in Scotland and as such is included on the Scottish Biodiversity List[4] (SBL). The potential effects of development on otter are therefore a material consideration in determining planning applications.

The purpose of the otter survey was to determine the status of this species within the Study Area. The survey derives the baseline status of otter against which the predicted effects of the HNB Decommissioning Project on this species will be assessed. Where necessary these survey data will also inform plans to mitigate the effects of the Project on otter.

[1] https://www.nature.scot/sites/default/files/2019-01/Species%20Planning%20Advice%20Project%20-%20otter.pdf
[2] EDF Energy Nuclear Generation Ltd (2013 to 2018). Hunterston B Land Management Annual Review
[3] EDF Energy Nuclear Generation Ltd (2017) Hunterston Integrated Land Management Plan.
[4] The Scottish Biodiversity List is a list of plants, animals and habitats that Scottish Ministers consider to be of principal importance to biological conservation. https://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL

Data collection locations

A review of 1:25:000 scale Ordnance survey (OS) maps[5] and aerial imagery (Google Maps[6] and Bing Maps[7]) informed the targeting of survey effort, which focused on coastal areas and watercourses, such as ditches, within the Study Area. The surveys were extended away from these areas to include adjacent terrestrial habitats where these were judged by surveyors to be suitable for otter.

Data on potential breeding sites (within which a natal holt is located) tend to be sparse and in some instances contradictory, which may reflect the fact that females tend to choose remote and secretive locations, often some distance away from main watercourses, upstream along small tributaries, within reedbeds, scrub / woodland and sometimes in open ground (e.g. on peatland sites in Shetland and in other upland areas in Scotland (Liles 2003[8]). Breeding sites are most likely to occur adjacent to a good food supply, at locations that are undisturbed and at low risk of flooding.

Data collection methods

The otter survey was conducted on 17th July 2019, during low tide conditions to ensure maximum accessibility and survey cover within the Study Area. During the survey, all areas of potentially suitable otter habitat were inspected to map and record (location, type, condition, and age), in a series of 'Target Notes', evidence of otter activity, with reference to standard descriptions (Harris and Yalden 2008[9]; Bang and Dahlstom 2006)[10]; and Chanin 2003[11]):

- **Rest sites:**
  - Holt – underground features used for shelter and rest, often in natural cavities, such as tunnels at the edge of riverbanks, or underneath tree root plates, heather root matrices, or boulder piles. Holts can also be within man-made structures e.g drains or embankments;
  - Couch –typically above ground resting sites used for sleeping or grooming, often on the banks of watercourses, ponds or lochans and occasionally further inland in thick vegetation or reedbeds. Places ('rolling places') where the otter dries and grooms its fur after leaving the water may also be used as couches;
  - Natal holt/natal den – discrete holt that is used by a female to birth the cubs and where they can remain for up to three months; and
  - Nursery area – area within a breeding site where there is a high level of activity associated with cubs, which is unlikely to be the primary natal holt where the cubs were born.
- **Activity signs:**
  - Spraint **-** otter faeces, which tend to be black or green-black in colour and have distinct aromas. They are generally composed of fish remains and crustacean shells. Spraints are often located on prominent features within the channel or river bank, such as large rocks, and can also be found close to or within the entrance to holts or couches;
  - Feeding sign - remains of prey such as fish and skinned amphibians;

[5] www.ordnancesurvey.co.uk
[6] www.maps.google.co.uk
[7] https://www.bing.com/maps
[8] Liles, G. (2003). Otter Breeding Sites: Conservation and Management. Conserving Natura 2000 Rivers Conservation Techniques Series No. 5, English Nature Peterborough.
[9] Harris, S., Yalden, D.W. (2008). *Mammals of the British Isles: Handbook*, 4th Edition. Mammal Society.
[10] Bang, P., Dahlstrom, P. (2006). *Animal tracks and signs.* Oxford University Press.
[11] Chanin, P. (2003). *Ecology of the European Otter.* Conserving Natura 2000 Rivers, Ecology Series No. 10. English Nature, Peterborough.

- Prints - otters have five toes and unique footprints that can be identified in mud, silt or sand, typically at the edge of waterbodies;
- Paths - routes that otters use to traverse land, often between watercourses and resting places; and
- Play areas/ slides - areas where otters slide down a steep, often grassy, bank.

Rest sites that are indistinguishable as either holts or couches are categorised as 'rest sites'. Features that appear to be suitable as otter rest sites and lack evidence of otter activity were recorded as 'potential rest sites' (or potential holts or couches) and categorised as outlined above. Notes on habitat suitability within the Study Area more generally were also recorded. Features referred to as 'active' are features that include evidence of recent otter activity.

Survey constraints

A long stretch of rock armour along the coastline to the west of the Study Area has many interlinked crevices and sheltered alcoves and has the potential to support otter rest sites (holts/natal dens/nursery areas/couches). However, this structure was not safely accessible for close inspection and was checked from pathways and along the coastline (during low tide conditions) with the aid of binoculars.

3. Results

3.1 Desk study

There is a record (2015) of otter activity (spraint) within 3km of the Site. A dead otter has also been recorded previously on the HNB access road. These records are included in a separate report (*HNB Decommissioning EIA – Baseline Report: Desk Study [Terrestrial Ecology]*)

3.2 Field survey

The otter survey results are marked on **Figure 3.1, Appendix A** and the accompanying Target Notes (TN) and photographs are included in **Appendix C.** Evidence of otter activity was recorded along the rocky coastline to the north-west of the Study Area:

- Three otter holts (TN1-3), typically situated underneath large boulders that form sheltered underground cavities and are characterised by the presence of spraints;
- Otter couch (TN4) sheltered by a large boulder, but not extending underground or into a rock cavity, partially covered by rocks, with fresh and old spraints recorded; and
- Two potential holts (TN5 and TN6) in sheltered alcoves, extending beneath large boulders along the coastline, lacking obvious signs of otter activity.

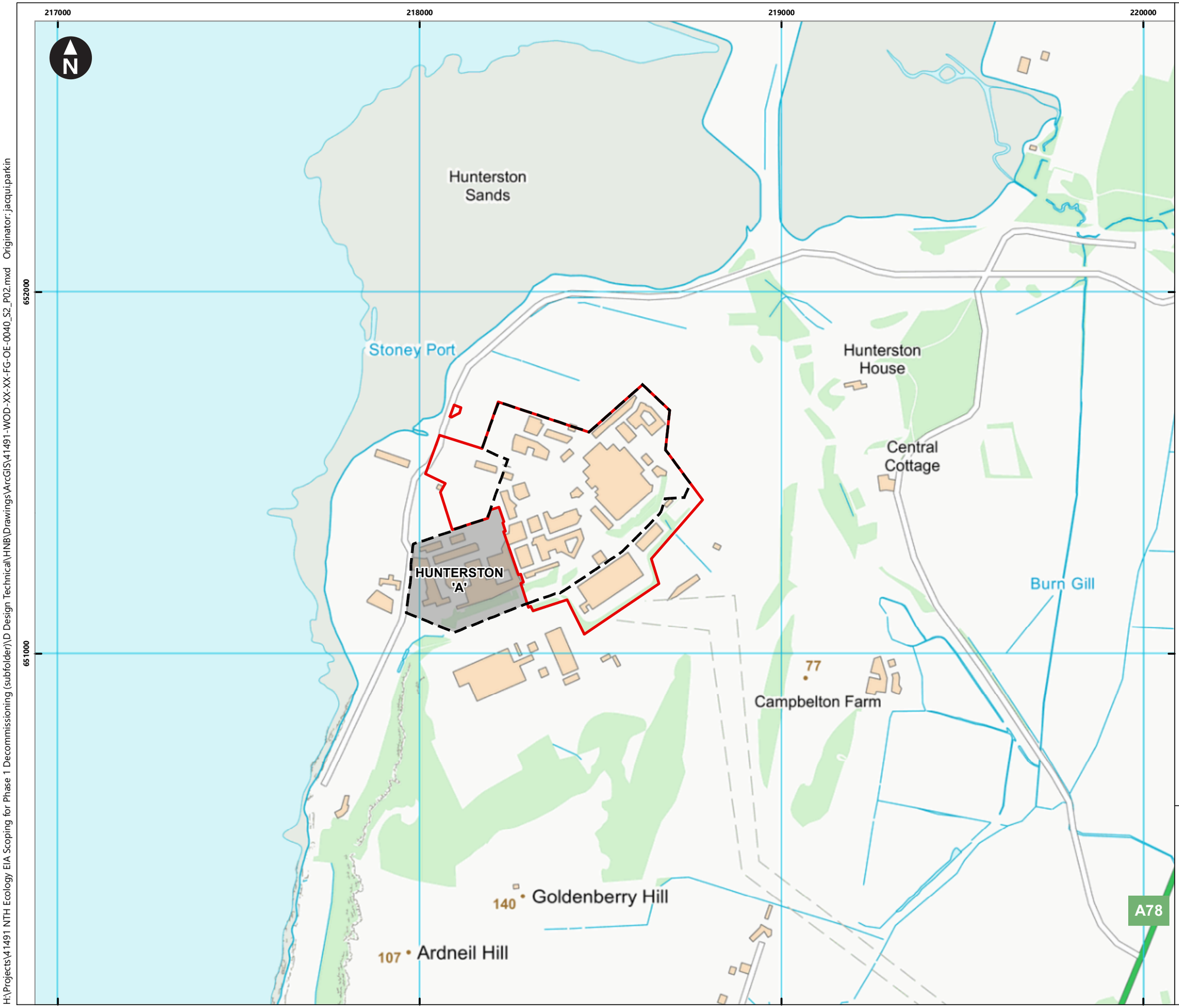
While it was not possible to survey the rock armour along the coastline to the south-west of the Study Area in detail, it has many interlinked crevices and sheltered alcoves (TN 7) and is likely to provide suitable habitat for otter rest/shelter sites.

4. Summary and conclusions

4.1 Current baseline

Evidence of otter activity was recorded along the rocky coastline within the north-western part of the Study Area, including spraints, three active holts, two potential holts, and one active couch. Crevices/alcoves in the rock armour extending along the coastline to the south-west of the Study Area, also provide potential rest/shelter sites. It is likely that otters use the coastline for foraging, commuting and resting. Otters could also establish natal holts and/or nursery areas within the Study Area, potentially making use of one or more of the coastal habitat features summarised in **Appendix C**.

Appendix A
Figures



Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence

0 100 200 300 400 m

Scale at A3: 1:10,000

Hunterston B Decommissioning EIA
Baseline Report: Otter

Figure 1.1
Site location plan

November 2019

wood.

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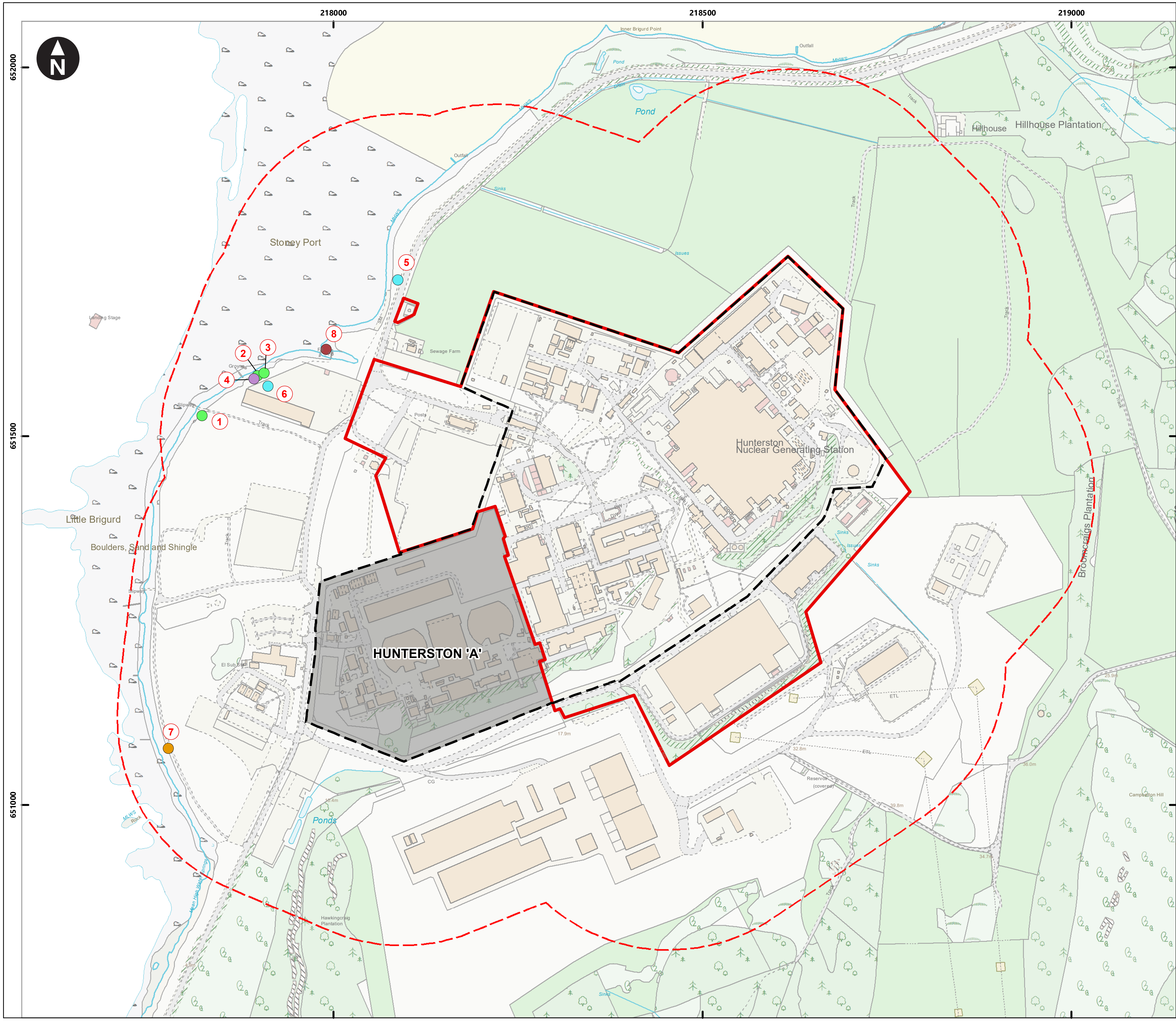


Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 250m
- Holt
- Potential holt
- Couch
- Potential otter rest sites (holts/couches)
- Spraint
- Target note

0 100 200 300 m

Scale at A3: 1:5,000

Hunterston B Decommissioning EIA
Baseline Report: Otter

Figure 3.1
Otter survey results

November 2019

wood.

Appendix B
Relevant legislation

Otters are defined as a European Protected Species (EPS) under the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (The Habitats Directive). The Conservation (Natural Habitats *&* *c*.) Regulations 1994 (as amended in Scotland) translates this European legislation into Scottish law, which makes it an offence to deliberately or recklessly:

- Capture, injure or kill such an otter;
- Harass an otter or group of otters;
- Disturb an otter while it is occupying a structure or place used for shelter or protection;
- Disturb an otter while it is rearing or otherwise caring for its young;
- Obstruct access to an otter resting place or breeding site, or deny an animal use of a resting place or breeding site;
- Disturb an otter in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species; and
- Disturb an otter in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

It is also an offence to damage or destroy a resting place or breeding site of an otter (whether deliberately or recklessly), and to keep, transport, or offer for sale or exchange, any wild otter.

Any activity that is likely to affect an otter requires consultation with the relevant statutory nature conservation organisation prior to works commencing. In Scotland, this is Scottish Natural Heritage (SNH).

Appendix C
Target Notes

Target Note	Evidence of otter activity	Grid reference	Description	Photograph
1	Holt	NS 17822 51528	A sheltered alcove extending two to three metres under large concrete slabs. At least four spraints (recent and old) inside the alcove.	
2	Holt	NS 17897 51582	Otter holt within a sheltered alcove, extending beneath large boulders. Two potential entrances/ exits. One fresh and one old spraint inside the alcove.	
3	Holt	NS 17906 51586	Otter holt in sheltered alcove, extending under large boulders. One fresh otter spraint at the entrance.	
4	Couch	NS 17892 51578	Otter couch under two leaning rocks, which is open to the elements on both sides. A pile of fresh and old spraint within the feature.	

5	Potential holt	NS 18087 51712	Potential holt extending under a large rock on the beach. One recent spraint inside alcove.	
6	Potential holt	NS 17911 51568	Potential holt, under boulders. No evidence of otter activity, however a large tunnel extends two to three metres into the bank.	
7	Potential otter rest sites (holts/couches)	NS 17776 51077	Coastal rock armour provides an extensive area of habitat suitable for otter rest/shelter sites. This area was not safely accessible and was not be surveyed in detail.	
8	Spraint	NS 17990 51618	Fresh spraint on rock.	N/A

Appendix 8D: Baseline Report Badger

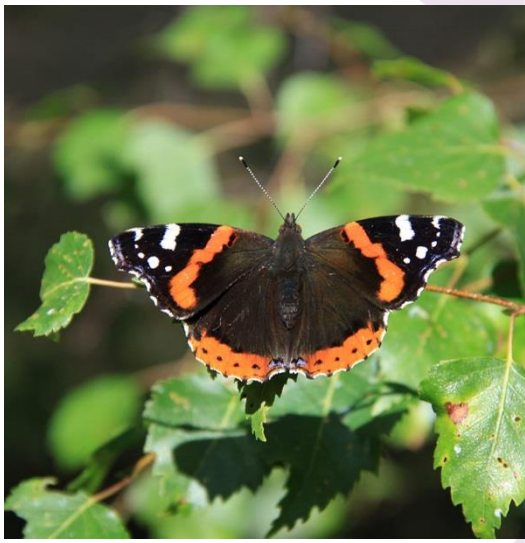
Due to the sensitive nature of badger records this report is not publicly available

Appendix 8E: Baseline Report Bats

EDF Energy

Hunterston B Decommissioning EIA

Baseline Report: Bats



Wood Environment & Infrastructure Solutions UK Limited – December 2019

wood.

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Document revisions

No.	Details	Date
1	Draft for client comment	October 2019
2	Final	December 2019

Contents

1. Introduction

1.1 Purpose of this report

EDF Energy propose to start preparation for waste processing facilities (Operational and Decommissioning Waste) and waste stores (ILW Store) at Hunterston B (HNB) to support decommissioning activities following the End of Generation (EoG), which is currently scheduled to be in 2023. Prior to the construction of these facilities, planning permission from the Local Planning Authority (LPA) under Town and Country Planning (Scotland) Act 1997 (TCPA) will be required. Other permissions and consents for the overall decommissioning project will be required separately under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning (EIAD)) Regulations, 1999, as amended, and EURATOM Article 37 (or an equivalent).

The current strategy is for an EIA to be undertaken and a single Environmental Statement (ES) to be prepared to assess the environmental impacts of the proposed decommissioning project under both the TCPA and EIAD Regulations. Other consents for specific activities will also be required and can draw on the EIAs.

This report sets out information about the bat surveys undertaken to inform the Environmental Impact Assessment (EIA) of the HNB Decommissioning Project. It includes a brief description of the proposed HNB Decommissioning Project before setting out information about the bat survey methods, results and conclusions.

1.2 Scheme description

Decommissioning of the Site is expected to commence in 2023. The Site location is shown in **Figure 1.1, Appendix A.** The decommissioning process will begin with the process of defueling and initial decommissioning, with spent fuel transferred to the Sellafield nuclear licensed site. Over approximately a 15-year period there will be a process of safe storage and management of intermediate and low-level waste, with intermediate-level waste stored temporarily on or near the site, in sealed and shielded containers within designed stores that have similar characteristics to industrial units, and low-level waste being transferred to appropriate treatment or disposal facilities. In parallel with these tasks, redundant buildings will be de-planted and demolished.

This initial decommissioning phase will include construction of waste processing facilities and a secure, weathertight, Safestore structure – a clad, steel framed structure based around the reactor building – will be constructed, to enclose the Advanced Gas-cooled Reactors, allowing the process of radioactive decay to reduce dose to significantly lower levels. The second phase of decommissioning – Care & Maintenance - will involve ongoing site/station care and maintenance over a period of approximately 70 years. The third phase will involve reactor building decommissioning and final site clearance involving site-wide demolition of the remaining buildings and remediation to an extent conforming to the applicable regulations at the time, followed by back-filling. Aside from the defueling and management of waste storage and decay processes, the site will operate similar to a conventional construction/demolition site.

1.3 Site context

The HNB site ('The Site' or 'the Station') is in West Kilbride, North Ayrshire, situated on the Firth of Clyde. The centre of the station is at approximate National Grid Reference (NGR) NS 184 514 and the area that is subject to the Nuclear Site Licence (NSL) extends to approximately 30ha. The majority of the station is built structures and hard standing (mainly access and car parks). Hunterston A (HNA) is situated to the west of, and immediately adjacent, to HNB.

2. Methodology

2.1 Study Area

The site includes the land inside the HNB double security fence and the land that is covered by the HNB Nuclear Site Licence (NSL). The Study Area includes the Site and a 50m (radius) perimeter area ('buffer'). The study area is shown on **Figure 2.1**. **Appendix A**.

2.2 Desk study

A desk-based study was undertaken to collate and review existing information on ecological features that are known to occur, or have previously been recorded, on land within and surrounding the Study Area defined in **Section 2.1**. These features include sites designated for nature conservation; habitats of importance for nature conservation; and legally protected and/or otherwise important species (including bats). The desk study is detailed in a separate report (*Hunterston B Decommissioning – Baseline Report: Desk Study [Terrestrial Ecology*]).

Data collected from the South West Scotland Environmental Information Centre (SWSEIC), formally Dumfries and Galloway Environmental Records Centre, includes details of species (including bats) recorded within approximately 3 km of the Site. The Hunterston B Land Management Annual Reviews[1] (LMAR) and Hunterston Integrated Land Management Plan[2] (ILMP) also include details of species (including bats) recorded within the Study Area.

2.3 Field surveys

Overview

All UK bat species are legally protected (**Appendix B**). A number of bat species are also Species of Principal Importance for the Conservation of Biological Diversity in Scotland and as such are included on the Scottish Biodiversity List[3] (SBL). The potential effects of development on bats are therefore a material consideration in determining planning applications. The HNB Decommissioning project has the potential to have adverse effects on bats that roost within and/or outside of the Site boundaries, recognising that bats that roost outside a development site may use that site for commuting and/or foraging. This has been taken into account in defining the scope of the baseline surveys.

[1] EDF Energy Nuclear Generation Ltd (2013 to 2018). Hunterston B Land Management Annual Review
[2] EDF Energy Nuclear Generation Ltd (2017) Hunterston Integrated Land Management Plan.
[3] The Scottish Biodiversity List is a list of plants, animals and habitats that Scottish Ministers consider to be of principal importance to biological conservation. https://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL

The purpose of the surveys was to derive the baseline status of bats within the Study Area, against which the predicted effects of the HNB Decommissioning Project on this group of species will be assessed. Where necessary the survey data will also inform plans to mitigate the effects of the Project on bats.

No surveys were undertaken within HNA (**Figure 2.1**), which is predominantly hard standing and buildings, because the HNB decommissioning project does not currently include any planned activities within HNA.

The bat surveys involved a combination of bat roost surveys and bat activity surveys, progressing systematically from Preliminary Roost Assessment (PRA) surveys to more detailed surveys based on Bat Conservation Trust (BCT) guidance (Collins, 2016[4]). The different survey methods that were employed are described below, following the sequence in which they are presented in the BCT Guidelines (Collins, 2016) and divided into those that focus on bat roosts and those that focus on other bat activity.

Bat roost survey

Preliminary Roost Assessment – buildings/structures

The built structures within the HNB double security fence, excluding buildings within the adjacent Hunterston A station, were subject to PRA. The purpose of this was to determine the requirement for, and scope of, any follow-up bat activity survey work and/or any more detailed inspection of potential bat roosts, including hibernacula (over-wintering roosts). The PRA was undertaken during suitable weather conditions (warm and dry) on 13th, 14th and 16th May 2019.

The survey method was in accordance with standard good practice guidance (Collins, 2016). The buildings and structures within the Study Area were systematically inspected during daylight, and any features suitable for roosting bats were recorded. This can include, for example, weatherboarding, hanging tiles, soffit boxes, gaps in brickwork, cracks, crevices, slipped or broken tiles and gaps around ridge tiles and lead flashing. Potential entry/exit points to Potential Roost Features (PRFs) were also recorded. PRFs are defined by Collins (2016) as "*features that bats could use for roosting*". Roof coverings were viewed from ground-level using close-focusing binoculars. Any potential bat roost entry/exit points were identified and inspected for evidence of roosting bats, for example:

- Bat droppings on the ground or stuck to walls beneath potential roost entrances;
- Suitable entry and exit points around eaves, soffits, flashing, under tiles or gaps in mortar;
- Live bats, bat corpses or skeletons; and,
- Oily marks (from fur), or localised clean spots, around possible roosts/roost access points.

The aim of the PRA was to determine actual or potential presence of bats and to determine the need for, and scope of, any further survey effort. In accordance with good practice (Collins, 2016) the buildings were categorised according to their suitability for roosting bats (**Table 2.1**).

[4] Collins, J. (2016). Bat Surveys: Good Practice Guidelines. 3rd edition. Bat Conservation Trust. London.

Table 2.1 Guidelines on suitability of buildings for roosting bats (Collins 2016)

Suitability	Description
Negligible	Negligible habitat features on site likely to be used by roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions[a] and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation[b]).
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions[a] and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions[a] and surrounding habitat.

[a] For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

[b] Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015 in Collins 2016). This phenomenon requires some research in the UK but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.

The PRA is an initial assessment of the suitability of structures for roosting bats, based on observation of the exterior of the buildings only and informs the scope of follow-up survey work. It does not confirm presence/absence of bat roosts.

Preliminary Ground Level Roost Assessment - trees

A Preliminary Ground Level Roost Assessment was completed of all trees within the NSL area to identify potential bat roost features in the tree trunk/limbs i.e. cracks, crevices, holes (e.g. woodpecker holes), splits, ivy cladding, lifted bark and fissures. The aim of the preliminary Ground Level Roost Assessment was to determine actual or potential presence of bats and any requirement for, and scope of further survey work. The Preliminary Ground Level Roost Assessment was undertaken on 13th, 14th and 16th May 2019.

A rating of High, Moderate, Low or Negligible potential to support roosting bats was assigned to each tree or group of trees in accordance with BCT Guidelines (Collins, 2016). The surveyors used binoculars to look for evidence of bat activity associated with the above features, for example scratch marks, staining, droppings, and absence of cobwebs at potential roost access points. In accordance with relevant guidance, trees assigned a rating of Negligible or Low suitability were excluded from further surveys (Collin, 2016). The main focus of this assessment was to assess the suitability of trees as transitional, maternity, satellite or mating roosts during the bats' core active season (principally April-September). Any trees that appeared to be suitable for hibernating bats were also recorded.

Emergence/re-entry surveys – buildings/ structures

Following the Preliminary Roost Assessment (PRA), emergence/re-entry surveys were undertaken to determine whether the buildings/structures (Low, Moderate or High suitability) within the HNB double security fence were being used as roosts at the time of survey. This was undertaken in accordance with good practice (Collins 2016, Chapter 7), which recommends that buildings with 'High' roost suitability are subject to three surveys (two emergence surveys and one re-entry survey); those of 'Moderate' suitability are subject to two surveys (one emergence survey and one re-entry survey); and buildings with 'Low' suitability are subject to either one emergence or one re-entry survey.

The surveys consisted of dusk emergence and/or dawn re-entry surveys, during which surveyors observed the exterior or the potential roost and recorded any bats leaving or entering a roost. The surveys started either 15 minutes before sunset (emergence) or 2 hours before sunrise (re-entry) and continued for a period of 1.75 to 2 hours. When more than one survey was required as indicated above, at least one survey was a re-entry survey (Collins, 2016).

The surveys were conducted from July to September 2019 inclusive, in suitable weather conditions, i.e. at an ambient temperature of 10ºC or above, low wind and light or no rain. One survey was conducted between July and August on each building. In circumstances when more than one survey was required, the surveys were spread across the survey season, with at least two weeks between surveys. The survey parameters (including dates, start/finish times and prevailing weather conditions) are detailed in **Appendix C.**

Canon XA30 video cameras with infrared capabilities, accompanied by separate powerful infrared light sources, were used during the surveys to aid observation of bats in low light levels. Bat activity was recorded using a combination of visual observation and aural full spectrum or frequency division bat detectors (Elekon Batlogger M), which enable bats' ultrasonic calls to be heard. All bat calls were recorded digitally using the in-built recording feature.

Re-entry survey – short walked transects

A number of buildings were categorised as having 'Low to Negligible' ('particularly low') suitability for roosting bats, such as buildings that are of low suitability and also appear to be particularly prone to disturbance from lighting and/or noise. Rather than emergence/re-entry surveys, these buildings were subject to surveys along short, walked transects (Transects A to D, **Figure 2.2, Appendix A**) around the perimeter of these buildings. This was to allow observation of any bats returning to, or re-entering, roosts, recognising that bats can tend to 'swarm' near a roost entrance before entering. Each transect circuit took up to 10 minutes to complete, with surveyors deviating slightly from the transect route in response to any bat observed/recorded close to sunrise i.e. to attempt to track bats back to a roost.

The surveys were conducted from July to September 2019 inclusive, in suitable weather conditions, i.e. at an ambient temperature of 10ºC or above, low wind and light or no rain. The survey parameters (including dates, start/finish times and prevailing weather conditions) are detailed in **Appendix C**. These surveys began two hours before, and ended 15 minutes after, sunrise, encompassing the most likely period of pre-dawn foraging activity and re-entry into roosts. Bat activity was recorded using a combination of visual observation and aural full spectrum or frequency division bat detectors (Elekon Batlogger M), which enable bats' ultrasonic calls to be heard, with all bat calls recorded digitally using the in-built recording feature.

Bat activity surveys

Automated/static detectors

Two automated/static bat detectors (Elekon BatLogger A+) were deployed to record bat calls continuously, from 30 minutes before sunset to 30 minutes after sunset and for 5 consecutive nights per season: spring (April/May), summer (June/July/August) and autumn (September/October), in accordance with good practice (Collins 2016). One static detector was attached to a tree inside the double security fence, within the Site and one was attached to a fence on a grassland embankment adjacent to a strip of woodland, within the 50m perimeter area around the Site (**Figure 2.3, Appendix A**). The monitoring periods and weather conditions during these periods are included in **Section 3**.

Transect surveys

The scope of the bat activity transect surveys was determined based on an assessment of the suitability (for bats) of the habitats within the Study Area, in accordance with BCT Guidelines (Collins, 2016). The Study Area

mainly comprises areas of hard standing, improved grassland and poor semi-improved grassland and is of relatively 'Low' suitability for bats. A single survey transect route was defined to cover this range of habitats within the Study Area. The transect route is detailed, alongside the survey results, in **Section 3**.

The transect was surveyed once in spring (April/May), summer (June/July/August) and autumn (September/October), in suitable weather conditions, i.e. at an ambient temperature of 10°C or above, low wind and light or no rain. The survey parameters (including dates and prevailing weather conditions) are detailed, along with the survey results in **Section 3**. The spring and autumn surveys were undertaken in the same direction along the transect, whereas the direction was reversed during the summer survey, sampling different parts of the transect at differing times after sunset.

In each case the surveyor walked along the transect from sunset, for a minimum of two hours after sunset, recording the bat species observed, the number of bat passes and the type of activity (e.g. foraging, social calls). Bat calls were monitored using Elekon BatLogger M detectors, with all bat calls recorded digitally using the in-built recording feature.

Data analysis

Data/recordings collected by the automated/static detectors and by hand-held detectors during transect surveys (and roost emergence and re-entry surveys) were analysed using BatExplorer software, with reference to Russ 2012[5] to aid species identification. Bats were identified to species where possible. In some cases bats could only be identified to genus/species group, for example in the event that the recorded calls could not be separated/attributed to one of two species that have similar/overlapping call parameters e.g. *Pipistrellus* sp. (common pipistrelle or soprano pipistrelle); and *Nyctalus* sp. (noctule or Leisler's bat).

Survey parameters

As outlined above, the bat surveys were undertaken during suitable weather conditions, with little or no rain, no excessive wind and temperatures above 10°C. These conditions are unlikely to deter bats from flying. Temperature, humidity, cloud cover and rainfall were recorded by the surveyors during each survey. Other relevant environmental parameters that could influence bat activity, such as background noise or artificial light, were also noted. Details of the recorded survey parameters are included in **Section 3**.

Dawn re-entry surveys and dawn activity transect surveys were undertaken within the period July to early September, when bats are most likely to remain active throughout the night. This avoided spring and autumn, when bats are more likely to return to roost early and not emerge again before sunrise.

5 Russ, J. (2012). British Bat Calls: A Guide to Species Identification. Pelagic publishing.

Survey constraints

A malfunction on Static Detector 2 (**Figure 2.3**) resulted in only 4 days (4th to 7th September 2019) of recording by this detector in September. However, a total 14 days of bat activity data were recorded at this location over the 15-day monitoring period and this is unlikely to have substantively influenced the survey results/conclusions.

3. Results

3.1 Desk study

Statutory biodiversity sites

There are no statutory biodiversity sites that are designated or notified for bats within 10km of the Site. Portencross Woods SSSI, however appears to be notable in terms of its proximity to the Site (0.3km west of the Site) and its potential to provide foraging and/or roosting habitat for bats. Statutory site descriptions and locations are detailed in a separate Desk Study report (*Hunterston B Decommissioning EIA – Baseline Report: Desk Study [Terrestrial Ecology]*).

Non-statutory biodiversity sites

There are no non-statutory biodiversity sites within 3km of the Site that are designated for bats or have bats listed in their citations. A total of 19 non-statutory biodiversity sites situated within approximately 3km do, however, appear to be notable in terms of their potential to provide foraging and/or roosting habitat for bats and the site descriptions and locations are included in a separate Desk Study report (*Hunterston B Decommissioning EIA – Baseline Report: Desk Study [Terrestrial Ecology]*):

- Goldenberry Hill SWT Wildlife Site (0.25km south);
- Campbelton Hill and Watermeadow SWT Wildlife Site (0.5km south-east);
- Ardneil Bank Wood and Southbanks, Portencross SWT Wildlife Site (1.75km south);
- Glen Burn (Crosbie to North Southannan) Provisional SWT Reserve (2km east);
- Seamill to Ardneil Bay Provisional SWT Reserve (2.3km south);
- Portencross Woods - Ancient Woodland Inventory (0.1km south-west);
- Goldenberry - Ancient Woodland Inventory (0.2km south);
- Campbelton Wood - Ancient Woodland Inventory (0.36km south-east);
- Hunterston House Wood - Ancient Woodland Inventory (0.5km east);
- Thicket Plantation - Ancient Woodland Inventory (1.4km south);
- Kilruskin Wood - Ancient Woodland Inventory (1.5km east);
- Ardneil Bank Wood - Ancient Woodland Inventory (1.9km south east);
- Carlung Wood - Ancient Woodland Inventory (2 km south east);
- Kilruskin Glen Ancient Woodland Inventory (2 km east);
- The Glen - Ancient Woodland Inventory (2.1 km north-east);
- Allan Wood - Ancient Woodland Inventory (2.25 km north-east);
- Dykes Plantation - Ancient Woodland Inventory (2.7 km east);
- The Avenue - Ancient Woodland Inventory (2.9 km south-east); and
- South Annan - Ancient Woodland Inventory (3.1 km north-east).

Bat records

The South West Scotland Environmental Information Centre (SWSEIC) holds records of Common pipistrelle (Pipistrellus pipistrellus), Soprano pipistrelle (*Pipistrellus pygma*eus), brown long-eared (*Plecotus aurita*) and Myotis sp. within 3km of the Site. However, SWSEIC does not hold any records of bat roosts within 5km of the Site. The Hunterston B ILMP and LMARs include details of inspections of bat boxes around the Hunterston Estate between 2015 and 2018, which recorded roosting bats, including but not necessarily limited to soprano pipistrelle and common pipistrelle.

3.2 Field surveys

Overview

Based on BCT Guidelines (Collins, 2016), the habitats within the Study Area have been categorised collectively as being of Low suitability for bats, predominantly comprising hardstanding, improved grassland and poor semi-improved grassland, with only limited extents of more suitable habitats, including hedgerows, broadleaved woodland, mixed planation and scattered trees. The bat survey scope was therefore consistent with that recommended (Collins, 2016) for surveys of potential roosts and for habitats that are of Low suitability for bats:

- Preliminary Roost Assessment;
- Emergence/re-entry surveys of potential roosts – plus surveys of particularly low suitability buildings along short, walked transects;
- Automated/ Static Bat Activity Surveys; and
- Transect Bat Activity Surveys

Bat roost surveys

Preliminary Roost Assessment – buildings and built structures

The majority of buildings within the study area are of negligible, or low to negligible, suitability for roosting bats, being of modern construction, lacking obvious potential roost features and prone to disturbance from noise/lighting. A total of 41 buildings/built structures or building complexes within HNB are potentially suitable (High, Moderate, Low and Low-to-Negligible suitability) for roosting bats as summarised in **Table 3.1**. Table 3.1 also indicates the level of follow-up survey work (emergence/re-entry survey) required at each building. The locations of buildings that are potentially suitable for roosting bats are shown on **Figure 3.1**. Further details of these buildings and associated features that are potentially suitable for roosting bats are included in the PRA results (**Appendix D)**.

A total of 48 buildings/ built structures/complexes within the HNB double security fence are likely to be of negligible suitability for roosting bats – these are omitted from Figure 3.1 and included on **Sheet 1 (Appendix A)**: **29, 32, 34, 43, 46, 47, 48, 50, 51, 52, 111, 116, 117, 122, 130, 143, 145, 148, 151, 159, 171, 174, 177, 178, 179, 181, 184, 185, 191, 193, 194, 196, 198, 199, 201, 202, 205, 206, 208, 209, 210, 215, 217, 221, 225, 244, 246** and **249.**

The buildings within the double security fence are unlikely to be suitable as bat hibernacula. Buildings that are currently occupied/in use are prone to disturbance and temperature fluctuations and therefore do not provide stable conditions suitable for hibernating bats. Similarly, the other buildings do not appear to include internal voids or superficial features that would be likely to create stable (cool and humid) conditions suitable for hibernating bats.

Table 3.1 Preliminary Roost Assessment (categorisation of roost suitability)

Moderate suitability (one dusk emergence survey and one dawn re-entry survey)	Low suitability (one dusk emergence or one dawn re-entry survey)	Low to negligible suitability (require walked transect only)[1]
197, 224	27, 35, 42, 108, 115, 118, 142, 152, 153, 207, 212, 216, 227, 228, 229, 231, 248.	28, 31, 102, 119, 123, 132, 139, 147, 160, 161, 162, 172, 175, 176, 180, 186, 189, 190, 192, 203, 214, 239.

[1] Low suitability buildings are separated according to the follow-up survey work that is planned to determine likely presence/absence of roosting bats. A number of buildings have particularly low (Low to Negligible) suitability due to high levels of lighting and noise disturbance from machinery and have subsequently been surveyed using walked transects around the building, whereas other low suitability buildings have been subject to emergence/re-entry surveys according to BCT Guidance (Collins, 2016). These follow-up surveys are described below.

Preliminary Ground Level Roost Assessment - trees

The trees within the NSL area (**Figure 3.2**) have either Low or Negligible suitability for roosting bats, being predominantly immature/sub-mature trees of plantation origin and lacking potential bat roost features. Therefore, no further bat surveys of these trees are required.

Emergence/re-entry surveys – buildings/structures

The PRA surveys concluded that 19 buildings (Low and Moderate suitability for roosting bats) required emergence/re-entry surveys (**Table 3.1** and **Figure 3.1**). Emergence/re-entry surveys were conducted on all of these buildings in 2019. The survey parameters (including dates, start/finish times and prevailing weather conditions) are detailed in **Appendix C.** No bat roosts were recorded at any of these buildings.

Re-entry survey – short walked transects

A total of 22 buildings within the HNB double security fence are categorised as being of Low to Negligible suitability for roosting bats (**Table 3.1** and **Figure 3.1**) and were surveyed along short, walked transects around these buildings (**Figure 2.2**). No bat roosts were located during the short walked transect surveys. The survey parameters (including dates, start/finish times and prevailing weather conditions) are detailed in **Appendix C.**

Bat activity surveys

Automated/static surveys

The two batloggers deployed within the Study Area are referred to as Detectors 1 and 2 (**Figure 2.3**). Detector 1 was deployed inside the HNB double security fence, attached to a young sycamore tree (*Acer pseudoplatanus*), located approximately centrally within the Site. Detector 2 was deployed outside of the double security fence, attached to a fence on a grass embankment, adjacent to an area of broadleaved planation woodland, within the 50m perimeter area around the Site. The detectors were deployed for 5 nights during spring (17th to 21st May 2019), summer (20th to 24th July) and autumn (4th to 8th September). Minimum night time temperatures during this monitoring period where generally between 9°C and 17°C, falling below this to 6°C on two occasions (7th and 8th September).

Three species of bat were recorded:

- Common pipistrelle (*Pipistrellus pipistrellus*);
- Soprano pipistrelle (*Pipistrellus pygma*eus); and
- Noctule (*Nyctalus noctula*).

The total number of bat passes recorded by each static detector during the monitoring periods (5 nights) in spring (Table E1), summer (Table E2) and autumn (Table E3), as well as the total number of bat passes (separated by species) recorded during the three monitoring periods combined (Table E4) are summarised in **Appendix E**. Tables E1 to E4 (**Appendix E**) also include the mean number of bat passes per night recorded over each monitoring period.

Bats were recorded on all monitoring nights at Detector 2. There were a number of monitoring nights when no bat passes were recorded at Detector 1.

The most frequently recorded species was soprano pipistrelle, with a total of 2,295 passes recorded over 14 nights, with activity of this species highest at Detector 2 (mean 163.5 passes per night), compared to Detector 1 (mean 0.4 passes per night).

The second most frequently recorded species was common pipistrelle, with a total of 1,533 passes (mean 105.2 passes per night). Common pipistrelle was recorded more frequently than soprano pipistrelle at Detector 1, with an average (mean) of 6 passes per night, compared to 0.4 passes per night.

No noctule passes were recorded at Detector 1, however noctule was recorded at Detector 2 (mean of 3 passes per night). The majority of these passes (97%) occurred in summer (July). No noctule passes were recorded in May. A single pass by Nyctalus sp. was recorded at Detector 2 in July. It was not possible to distinguish whether this was attributable to a noctule (*Nyctalus noctula*) or Leisler's (*Nyctalus leisleri*) bat.

Transect surveys

The results of the three (spring, summer and autumn) bat activity surveys (transects) are summarised in **Table 3.2** and on **Figures 3.3** (May 2019)**, Figure 3.4** (July 2019) and **Figure 3.5** (September 2019). The transect surveys recorded similar species to the automated/static detector monitoring. Bat activity recorded during the transect surveys tended to be recorded within the south and east of the Study Area. More detailed survey results (Table F1 to F3) and survey parameters (including dates, start/finish times and prevailing weather conditions) are included in **Appendix F**.

Table 3.2 Transect Survey Results (Summary)

Date	Weather conditions	Bat species
13 May 2019	Warm (16°C) calm, dry. Weather conditions over previous days also ideal.	Soprano pipistrelle; Common pipistrelle
22 July 2019	Warm (18°C) light wind, dry. Weather conditions over previous days also ideal.	Soprano pipistrelle; Common pipistrelle; Noctule; and *Nyctalus* sp.
16 September 2019	Mild (15-13°C) calm, dry. Weather conditions over previous days also ideal.	Soprano pipistrelle; Common pipistrelle; *Pipistrellus* sp and *Nyctalus* sp

4. Summary and conclusions

4.1 Current baseline

Overview

The habitats within the Study Area are predominantly hardstanding, improved grassland and poor semi-improved grassland, which are of low suitability for bats. The habitats within HNA are similar to those within HNB. There is only a limited extent of more suitable habitats for bats within the Study Area, such as hedgerow, broadleaved woodland, mixed planation and scattered trees. Collectively therefore, the habitats within the Study Area are of low suitability for bats.

Three species of bats were recorded within the Study Area: soprano pipistrelle, common pipistrelle and noctule. Based on published information on the status and distribution of bats in the UK (Bat Conservation Trust, 2017; and Ayrshire Biodiversity Action Plan) the presence of these species in North Ayrshire is not unexpected. A single pass by Nyctalus sp. was recorded in July, however it was not possible to distinguish whether this was attributable to a noctule (*Nyctalus noctula*) or Leisler's (*Nyctalus leisleri*) bat.

The majority of buildings within the study area are of negligible, or low to negligible, suitability for roosting bats, being of modern construction, lacking obvious potential roost features and prone to disturbance from noise/lighting. There are buildings inside the double security fence that are of Moderate and Low suitability for roosting bats, however no bat roosts were recorded. This is likely to be attributable, at least in part, to the extent of hardstanding, limited vegetation and noise/light disturbance within this area; factors which mean the station is poor bat habitat more generally.

The buildings within the double security fence are unlikely to be suitable as bat hibernacula. Buildings that are currently occupied/in use are prone to disturbance and temperature fluctuations and therefore do not provide stable conditions suitable for hibernating bats. Similarly, the other buildings do not appear to include internal voids or superficial features that would be likely to create stable (cool and humid) conditions suitable for hibernating bats. The trees within this area, and the NSL area more generally, are of Low or Negligible suitability for roosting bats, being immature/sub-mature trees, of plantation origin and lacking potential bat roost features.

Low levels of bat activity (e.g. foraging/commuting) were recorded inside the double security fence. This area of predominantly hardstanding includes limited vegetation and is well illuminated in places and prone to noise disturbance from operational machinery. The habitats outside of the double security fence and around the perimeter of the Nuclear Site Licence Area appear to be less prone to light/noise disturbance and include improved grassland and poor semi-improved grassland, with limited extents of hedgerow, broadleaved woodland, mixed planation and scattered trees. These are more suitable habitats for bats, which is reflected in notably higher levels of bat activity in these areas.

Common pipistrelle and Soprano pipistrelle

Both common pipistrelle and soprano pipistrelle are Species of Principal Importance for the Conservation of Biological Diversity in Scotland (SBL species). They are two of the most common and widespread bat species that are resident in Scotland. Historic changes in agricultural practices throughout the UK coincided with a decline of these species. However, populations are being continuously monitored through surveys such as

the National Bat Monitoring Programme (NBMP) and through data collected in the field by professionals. These data indicate that common and soprano pipistrelle populations are increasing (BCT 2017[6]).

Summer roosts of both soprano and common pipistrelles tend to be in crevices around the outside of newer buildings, the average roost consisting of 200 individuals (BCT 2010a[7]). However, roosts can be found in trees and bat boxes, where pipistrelles can also be found in autumn and over winter. Pipistrelles tend to emerge from their roost 20-30 minutes after sunset and forage mainly on small insects such as midges. Soprano pipistrelles appear to have a closer affinity to riparian landscapes, often feeding over wetland habitats. Common and soprano pipistrelles are known to travel 5km from a roost (Avery 1991[8]) and although these species use a range of habitats, they exhibit preferences for riparian woodland and parkland and tend to avoid very open habitat. They often forage along regularly used flightpaths.

Soprano pipistrelle was the most frequently recorded species within the Study Area, followed by common pipistrelle. No roosts of either species were recorded, however both species are known to roost in bat boxes within the HNB Estate.

Low levels of soprano and common pipistrelle activity were recorded inside the double security fence. This area of predominantly hardstanding, includes limited vegetation and is well illuminated in places and prone to noise disturbance from operational machinery. The habitats outside of the double security fence, and around the perimeter of the Nuclear Site Licence Area, appear to be less prone to light/noise disturbance and include improved grassland and poor semi-improved grassland, with limited extents of hedgerow, broadleaved woodland, mixed planation and scattered trees. These habitat types tend to support greater concentrations of invertebrates, providing more foraging opportunities for bats than those inside the double security fence. This is reflected in notably higher levels of common pipistrelle and soprano pipistrelle activity recorded outside of the double security fence.

Noctule

Noctule is a Species of Principal Importance for the Conservation of Biological Diversity in Scotland (SBL species). Noctules forage over a range of habitat types, often including open woodland, unimproved grassland, lakes and rivers, where their prey is most common. This species roosts in holes in trees, with a preference for woodpecker holes in beech trees on the edge of woods or in the open.

[6] Bat Conservation Trust (2017). *The State of the UK's Bats – National Bat Monitoring Programme Population Trends* (http://www.bats.org.uk/pages/nbmp_reports.html)
[7] Bat Conservation Trust (2010a). Species Information Sheets - Soprano pipistrelle and Common pipistrelle (https://www.bats.org.uk/about-bats/what-are-bats/uk-bats).
[8] Avery, M. I. (1991). The Handbook of British Mammals (Ed. by G. B. Corbet & S. Harris), pp. 124-128. Oxford. Blackwell Scientific Publications

Although Noctule bats are relatively widespread in much of England, Wales and south-west Scotland, this species has become far less common, mainly due to the intensification of agriculture, which can result in loss of feeding habitat, such as permanent pasture, woodland edge and hedgerows. Loss of suitable trees for roosting has also been a contributing factor (BCT 2010b[9]). The UK population size has previously been estimated at 50,000 (Battersby, 2005[10]) and more recent monitoring data (BCT 2017) indicate that noctule populations are now increasing.

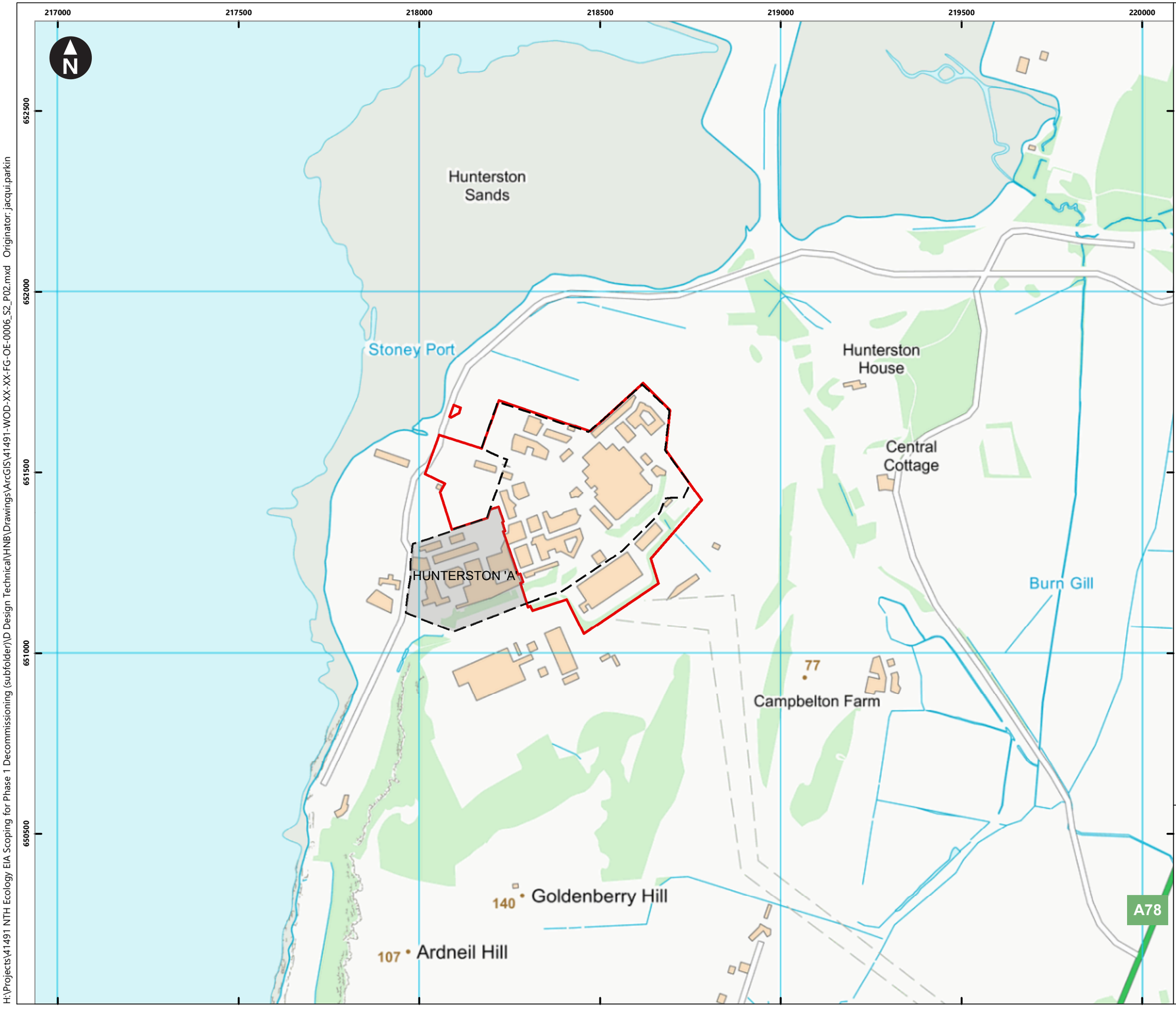
No noctule bat roosts were recorded and the habitats within the Study Area are of low suitability for roosting noctules, due to a lack of mature trees, which is the favoured roost habitat of this species. However, noctule foraging and commuting activity was recorded outside of the double security fence, within the 50m perimeter/buffer around the NSL area, in July and September 2019 by static detector monitoring and during the transect survey in July. This indicates that noctules that roost elsewhere forage/commute around the station perimeter.

[9] Bat Conservation Trust (2010b). Species Information Sheets – Noctule

[10] Battersby, J. (Ed) & Tracking Mammals Partnership. 2005. UK Mammals: Species Status and Population Trends. First Report by the Tracking Mammals Partnership. JNCC/Tracking Mammals Partnership, Peterborough

Appendix A
Figures

H:\Projects\41491 NITH Ecology EIA Scoping for Phase 1 Decommissioning (subfolder)\D Design Technical\HNB\Drawings\ArcGIS\41491-WOD-XX-XX-FG-OE-0006_S2_P02.mxd Originator: jacqui.parkin



Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence

0 100 200 300 400 m

Scale at A3: 1:10,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 1.1
Site location plan

October 2019

wood.

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651800 651700 651600 651500 651400 651300 651200 651100 651000

N

HUNTERSTON 'A'

Hunterston Nuclear Generating Station

A B C D

Sewage Farm

Posts

Track

Sinks

Issues

ETL

Reservoir (covered)

17.9m 32.8m 39.8m

Key

Hunterston B Nuclear Site Licence boundary

Buffer - 50m

0 50 100 150 m

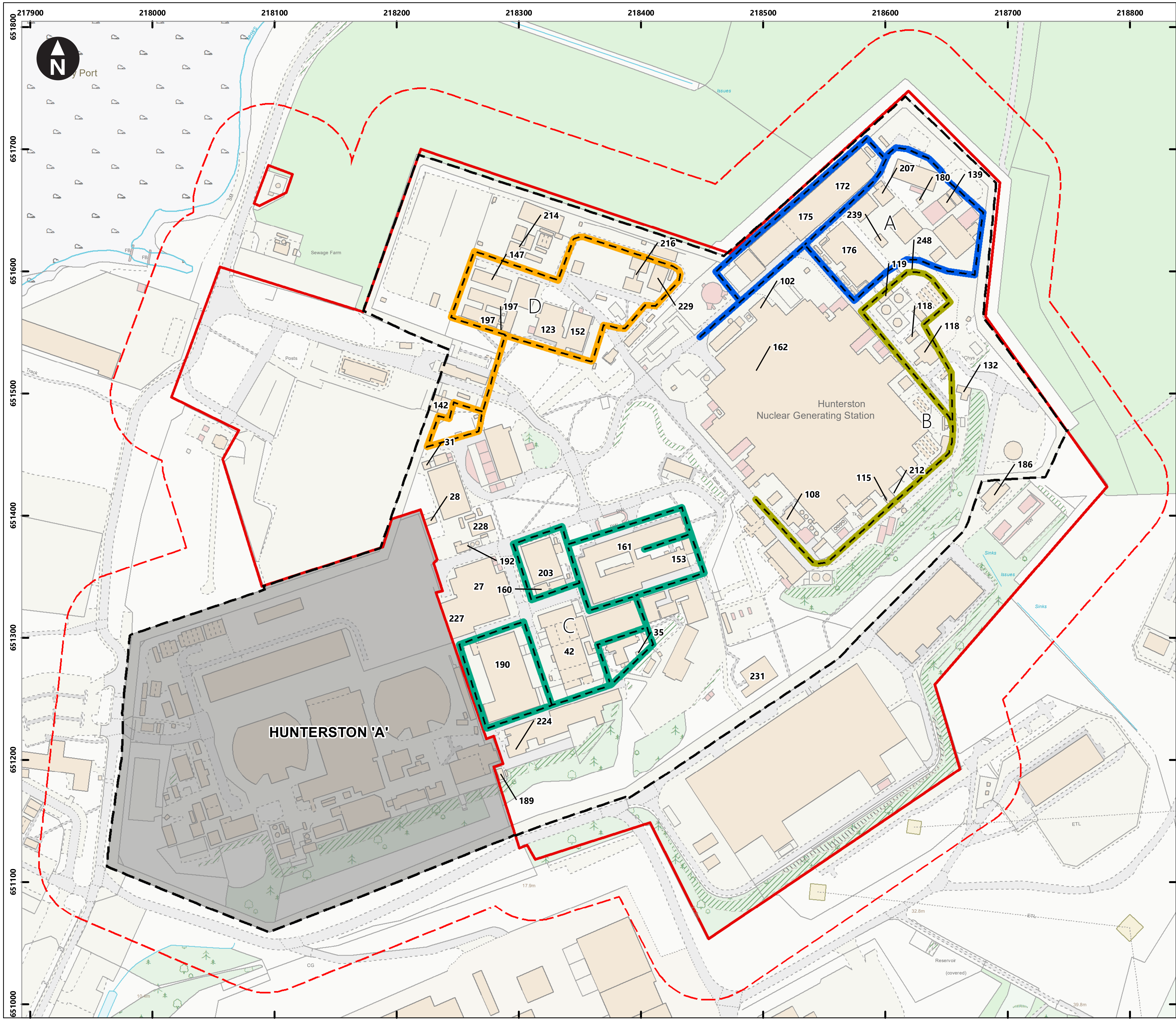
Scale at A3: 1:3,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 2.1
Study area (bats)

November 2019

wood.



Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 2.2
Transect surveys of buildings (Low to Negligible roost suitability)

November 2019

wood.

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Hunterston
Nuclear Generating Station

HUNTERSTON 'A'

Static detector 1

Static detector 2

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 50m
- Static detector

0 50 100 150 m

Scale at A3: 1:3,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 2.3
Static detector locations

November 2019

wood.

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Stanley Port

Sewage Farm

Hunterston
Nuclear Generating Station

HUNTERSTON 'A'

214 147 216 229 197 197 123 152 142 31 28 228 192 27 227 203 160 42 190 161 153 35 231 224 189 102 162 172 175 176 207 180 139 239 248 119 118 118 132 186 115 212 108

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 50m

Bat Roost Suitability

- Moderate
- Low
- Low to negligible

Note: All other buildings have negligible bat roost suitability / no further survey

0 50 100 150 m

Scale at A3: 1:3,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 3.1
Bat roost suitability - buildings

November 2019

wood.

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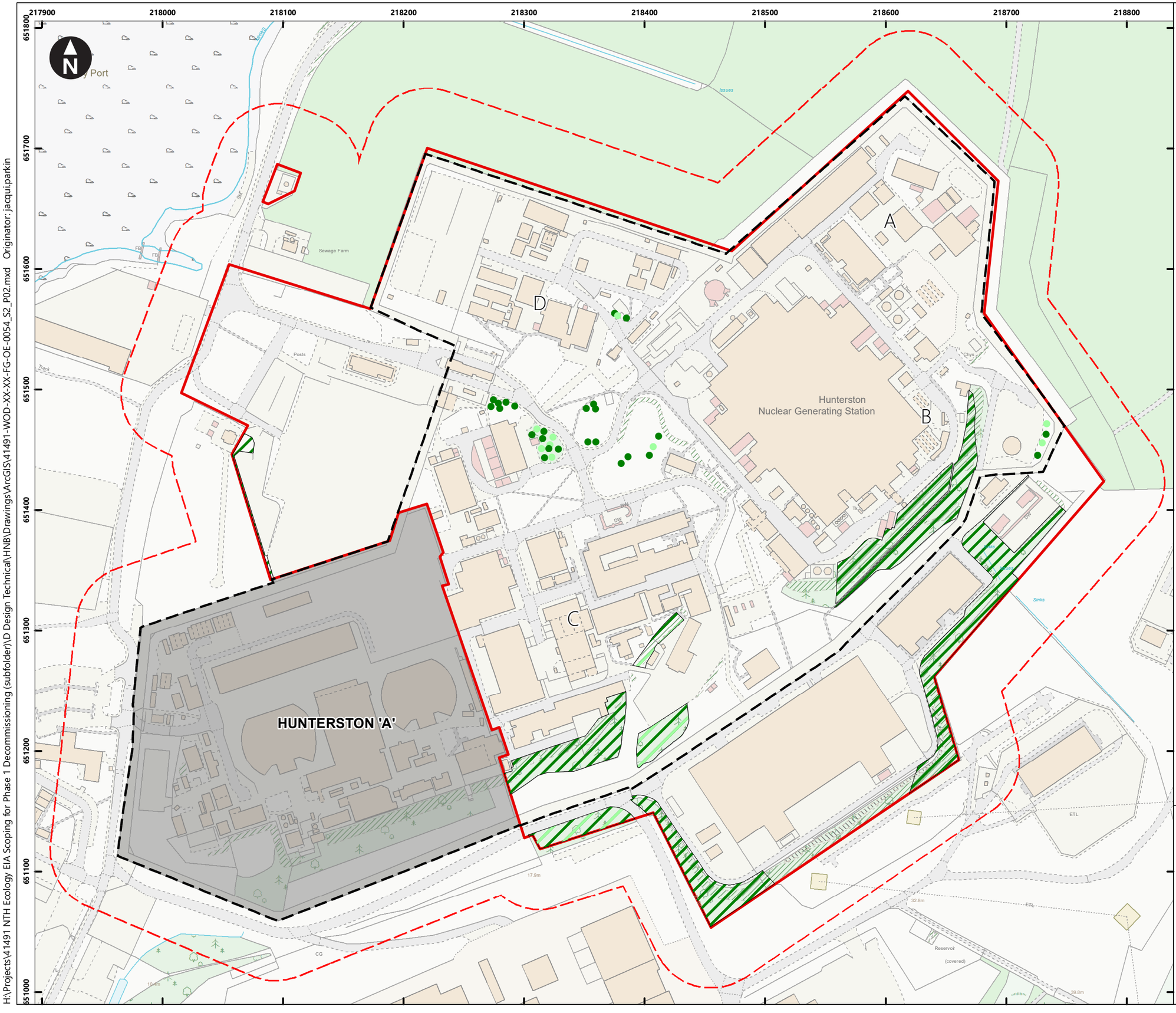

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 50m
- Parkland and scattered trees- broad-leaved
- Parkland and scattered trees - coniferous
- Broadleaved woodland - plantation
- Mixed woodland - plantation

Note:
All the trees mapped are of low or negligible suitability for roosting bats

0 50 100 150 m

Scale at A3: 1:3,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 3.2
Bat roost suitability - trees

November 2019

wood.

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HUNTERSTON 'A'

Hunterston
Nuclear Generating Station

Sewage Farm

Reservoir
(covered)

F

S

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 50m
- Transect and direction of walking
- Common pipistrelle
- Soprano pipistrelle

0 50 100 150 m

Scale at A3: 1:3,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 3.3
Bat activity transect survey - May 2019

November 2019

wood.

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651800 651700 651600 651500 651400 651300 651200 651100 651000

N

Port

Sewage Farm

Posts

Track

Issues

Sinks

Hunterston
Nuclear Generating Station

HUNTERSTON 'A'

S

F

Reservoir
(covered)

ETL

17.9m

32.8m

39.8m

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 50m
- Transect and direction of walking
- Common pipistrelle
- Noctule
- Soprano pipistrelle

0 50 100 150 m

Scale at A3: 1:3,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 3.4
Bat activity transect survey - July 2019

November 2019

wood.

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651800 651700 651600 651500 651400 651300 651200 651100 651000

N

Port

Sewage Farm

Hunterston
Nuclear Generating Station

HUNTERSTON 'A'

F

S

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Buffer - 50m
- Transect and direction of walking
- Common pipistrelle
- Noctule
- Nyctalus sp
- Pipistrellus sp
- Soprano pipistrelle

0 50 100 150 m

Scale at A3: 1:3,000

Hunterston B Decommissioning EIA
Baseline Report: Bats

Figure 3.5
Bat activity transect survey - September 2019

November 2019

wood.

Appendix B
Relevant legislation

All bat species in Scotland are afforded legal protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). This makes it an offence to deliberately or recklessly:

- Capture, injure or kill a wild bat;
- Harass a wild bat or group of wild bats;
- Disturb a wild bat in a roost (any structure or place which it uses for shelter or protection);
- Disturb a wild bat while it is rearing or otherwise caring for its young;
- Obstruct access to a bat roost or to otherwise deny the animal use of the roost;
- Disturb a wild bat in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of the species to which it belongs; and
- Disturb a wild bat in a manner that is, or in circumstances which are, likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

It is an offence of strict liability (i.e. it does not have to be demonstrated that the action was deliberate or reckless) to damage or destroy a bat roost, irrespective of whether it is occupied at the time.

Appendix C
Survey parameters (emergence/re-entry surveys)

Date	Building	Survey	Sunset/ sunrise	Survey Time	Temperature (start and end °C)	Rainfall	Cloud cover	Wind Speed	Moon (% visible)
23/07/19	228	Re-entry	05:09	03:09-05:24	>10	None	<5	Calm	-
23/07/19	228	Re-entry	05:09	03:06-05:24	>10	None	<5	Calm	-
23/07/19	216	Emergence	21:41	21:26-23:35	22-22	None	<5	Calm	-
23/07/19	216	Emergence	21:41	21:26-23:41	>10	None	10	Calm	-
29/07/19	115	Emergence	21:30	21:15-23:30	19-18	None	100	Calm	-
06/08/19	207	Re-entry	05:34	03:34-05:49	16-16	Heavy rain c.20 mins at start of survey	100	light	-
06/08/19	118	Re-entry	05:34	03:34-05:49	16-16	Heavy rain c.20 mins at start of survey	100	Light	-
06/08/19	227	Emergence	21:14	20:59-23:14	20-17	None	100	Calm	-
06/08/19	027	Emergence	21:14	20:59-23:14	20-17	None	100	Calm	-
07/08/19	224	Emergence	21:11	20:56-23:11	20-17	None	<5	Calm	-
07/08/19	231	Emergence	21:11	20:56-23:12	20-17	None	40	Light	50
12/08/19	153	Emergence	20:59	20:44-22:59	16-14	None	50	Calm	100
12/08/19	108	Emergence	20:59	20:44-22:59	16-14	None	50	Calm	100
13/08/19	35	Re-entry	05:47	03:45-05:51	12-12	None	90	Light	100
13/08/19	35	Re-entry	05:47	03:45-05:51	12-12	None	90	Light	100
14/08/19	Multiple (low to negligible suitability)	Re-entry (Transect A and B)	05:47	03:47-06:00	12-12	Light	90	Light	100
15/08/19	Multiple (low to negligible suitability)	Re-entry (Transect C and D)	05:51	03:51-06:06	12	Showers	90	Light	100
20/08/19	152	Re-entry	06:01	04:01-06:16	14-14	None	90	Calm	50

Date	Building	Survey	Sunset/ sunrise	Survey Time	Temperature (start and end °C)	Rainfall	Cloud cover	Wind Speed	Moon (% visible)
20/08/19	229	Re-entry	06:01	04:01-06:16	14-14	None	90	Calm	50
20/08/19	197	Emergence	20:43	20:28-22:43	15-14	None	80	Light	50
20/08/19	142	Emergence	20:43	20:28-22:43	16-16	None	60	Light	50
21/08/19	42	Emergence	20:40	20:25-22:40	17-14	None	60	Moderate	50
21/08/19	212	Emergence	20:40	20:25-22:40	16-14	None	100	Light	
17/09/19	197	Re-entry	06:55	04:55-07:10	12-10	None	30	Light	100
17/09/19	224	Re-entry	06:55	04:55-07:10	14-10	None	80	Light	100

Appendix D
Preliminary Roost Assessment

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
027	Single storey building 30-50 years	Brick	Flat felt roof	No	Small gaps between brickwork above the door on the south side of the building. A gap in the corner of the brickwork at NS 18277 51254. Gaps under roof flashing on north side of the building (e.g. NS 18269 51351)	No	Low
028	Single storey brick building 30-50 years	Brick	Flat felt roof	Metal flashing around roof edge	Small (c.2cm wide) gaps under the felt roof on the north side of the building. Gap between brickwork and roof on east side of the building (visible from north side of building).	No	Low to Negligible
029	Single storey building 30-50 years	Brick	Flat roof	Metal flashing around roof edge	None identified	No	Negligible
031	Single storey building 30-50 years	Brick	Flat roof	Metal flashing around roof edge; Ventilation bricks; Wooden framed windows	Gap above drainpipe on the north side, with a cavity in the brickwork that extends vertically. Extent of cavity not visible from ground level.	No	Low to Negligible
032	Single storey 30-50 years old	Brick	Flat roof	No	None identified	No	Negligible
034	Single storey – Open storage	Brick	Flat roof – plastic	No	None identified	No	Negligible
035	Single storey	Harling	Flat roof	No	Gaps between wall and roof edge	No	Low

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
042	Single storey building 30-50 years	Brick	Flat roof	No	Small gaps between top of wall and roof. Gaps in rusty corrugated iron.	No	Low
043	Single storey 30-50 years	Brick	Flat roof	No	No Features	No	Negligible
046	Single storey 30-50 years	Brick	Flat roof	Ventilation grids and metal case windows	Small gaps at metal casing at garage door	No	Negligible
047	Single storey 30-50 years	Brick, Aluminium	Flat roof	PVC and metal windows	None identified	No	Negligible
048	Single storey 30 years	Brick	Flat roof	PVC window	None identified	No	Negligible
050	Two storeys – portacabin 30 years +	Composite	Flat roof	Metal case windows	Walls sealed, no obvious access points	No	Negligible
051	Single storey 30 years	Brick, aluminium	Flat roof	PVC and metal case windows	Gap beneath doorway (south)	No	Negligible
052	Single Storey portocabin	Metal	Flat roof	None	None identified	No	Negligible
102	Single storey	Brick	Flat roof	None	North east facing hole around chemical storage area	No	Low to Negligible
108	Single storey	Brick	Flat roof	None	Potential access points between wall and roof.	No	Low
111	Single storey	Brick and Aluminium cladding	Flat roof	Ventilations grates	None identified	No	Negligible
115	Two storey	Brick	Flat roof	Ventilation grids	Gaps at corrugated iron along wall	No	Low
116	Single storey	Brick	Corrugated iron	No	None identified	No	Negligible

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
117	Single storey 30 years +	Brick	Flat roof	Ventilation grids	Limited access – no suitable access points observed	No	Negligible
118	Single storey 30 years +	Composite cladding	Flat roof	Large ventilation grids	Lots of gaps between metal roof and walls	No	Low
119	Single storey 30 years +	Brick	Flat roof	Doors for access	Holes in lintel above door	No	Low to Negligible
122	Single storey storage building.	Aluminium	Flat roof	None	Limited to none – not suitable.	No	Negligible
123	Single storey 30-50 years	Brick	Flat roof	None	Small gap between brick wall and roof, likely to be well sealed. Full extent not visible from the ground.	No	Low to Negligible
130	Portacabin building comprised of metal. Flat roof.	Metal	Flat roof, metal	None	None identified	No	Negligible
132	Single storey portacabin	Composite cladding, partly brick	Corrugated iron and composite cladding	Ventilation grates	Possible access points within corrugated roof at north facing side	No	Low to Negligible
139	Single storey	Brick	Flat roof	Wooden soffits and small ventilation grates	Gaps between wooden soffits and brick wall	No	Low to Negligible
142	No exterior walls, only metal pillars with a corrugated metal boxed ceiling. Flat, felted roof.	No side walls – metal pillars	Flat, felt roof	No	Gap between pillar and roof in the south corner of the structure.	No	Low
143	Single storey	Brick base with corrugated aluminium	Flat roof	PVC windows	No suitable access points	No	Negligible

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
145	Single storey	Brick	Flat roof	PVC windows	No suitable access points recorded	No	Negligible
147	Single storey,	Brick	Flat roof	PVC windows	Multiple features – gap between top of brick wall and roof. Multipole holes/crevices between wall support and roof.	No	Low to Negligible
148	Single storey	Aluminium	Aluminium	Ventilations grids	No suitable access points observed	No	Negligible
151	Single storey	Brick with Aluminium cladding		Large entry door and large ventilation shafts	No suitable access points observed.	No	Negligible
152	Single storey around 50 years old.	Brick	Flat roof	No	Gaps above fire exit door Gaps above garage door and in the wall (for wiring/ piping) on the south-east side of the building	No	Low
153	Single storey 30-50 years	Brick	Flat roof	PVC windows	Gap between soffits and brick wall	No	Low
159	Single storey	Brick	Flat roof	PVC windows	None identified	No	Negligible
160	Two storey portacabin	Harled exterior	Flat roof	Metal framed windows	Lifted boards at the top of the wall.	No	Low to Negligible
161	Single storey 30 years	Brick	Flat roof	Metal frame windows Ventilation gaps	One possible access point – loose brick at west corner of building	No	Low to Negligible
162	Tall structure comprising brick, corrugated metal, glass panels and a flat roof.	Aluminium	Aluminium	No	Gap in brickwork at NS 18542 51385. Corrugated metal sheets on the south side of the building is eroded, creating gaps that may provide potential temporary roosting feature.	No	Low to Negligible
171	Single storey	Brick	Flat	No suitable features recorded	None identified	No	Negligible

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
172	Single storey Approximately 30 years old.	Brick	Flat roof	No	Hole in brickwork and gap in flashing on the north side of the building.	No	Low to Negligible
174	Single storey approx. 30 years+	Brick	Flat roof	Metal framed windows, ventilation grates	None identified	No	Negligible
175	Single storey approx. 30 years.	Brick	Flat roof	No	Flashing lifted slightly on the north side of the building.	No	Low to Negligible
176	Single storey 30 years plus	Brick lower level with aluminium cladding at top level	Flat felt roof	Large, multiple metal case windows and ventilation grates	Hole in brick work joining brick and aluminium casing and gap in flashing. North facing.	No	Low to Negligible
177	Single storey Approximately 15 years	Aluminium (no insulation)	Aluminium	Two large garage style doors	None identified	No	Negligible
178	Single storey Approximately 15 years	Aluminium	Aluminium	Large garage style doors	None identified	No	Negligible
179	Single storey building, approximately 30 years old.	Brick	Flat roof	PVC windows Metal flashing Ventilation grates	None visible although metal flashing appears lifted.	No	Negligible
180	Single storey 30 years	Brick	Metal	Metal flashing	Small gaps (2-4cm wide) under wooden boards potentially allowing entry by a bat.	No	Low to Negligible
181	Single storey 30 years	Brick and composite cladding	Flat roof	Metal framed windows	None identified	No	Negligible
184	Single storey	Brick	Flat roof	None	Small hole in aluminium cladding above brick wall.	No	Negligible

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
	30 years +						
185	Single storey	Brick	Flat roof	None	None identified	No	Negligible
186	Single storey 30-50 years	Brick	Flat roof	Soffits	Small gaps (2-4cm wide) under wooden boards potentially allowing entry by a bat.	No	Low to Negligible
189	Single storey 30-50 years	Brick	Felt roof	Ventilation grates	Edge of felt roof lifted slightly	No	Low to Negligible
190	Single storey	Brick base, glass top	Flat roof – no visual		Limited access points	No	Low to Negligible
191	Single storey building with a brick base, glass panel surround, and a flat roof.	Brick and glass	Flat roof	None	None identified	No	Negligible
192	Single storey brick 30 years	Brick, metal	Flat roof	No	Gaps in the north-east corner of the building between bricks and metal work.	No	Low to Negligible
193	Single storey 30 years	Brick, glass	Metal	No	None identified	No	Negligible
194	Single storey	Brick	Flat roof	Wooden soffits Metal flashing	None identified	No	Negligible
196	Single storey	Brick	Flat roof	None	None identified	No	Negligible
197	Single storey	Harling	Flat roof	No	Hole in wooden soffit, lifted away from the wall in places. North west facing.	No	Moderate
198	Single storey, a few years old (c.2015)	Metal	Metal	No	None identified	No	Negligible
199	Single storey	Metal	Metal	No	None identified	No	Negligible

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
201	Single storey 30-50 years	Brick	Flat roof	Metal framed windows	None identified	No	Negligible
202	Single storey	Brick	Flat roof	No	None identified	No	Negligible
203	Single storey brick building	Brick, glass	Flat roof	No	On the western side of the building a small hole between the brick wall and top of building.	No	Low to Negligible
205	Single storey Estimated age is 30 years.	Brick	Flat roof	No	None identified	No	Negligible
206	Single storey 30-50 years	Brick	Flat roof	None	None identified	No	Negligible
207	2 storeys 30-50 years	Boarding	Flat roof	PVC Windows Ventilations grates	Potential access between roof of ground level and first level portacabin.	No	Low
208	Single storey portocabin	Metal	Metal	Metal case windows	None identified	No	Negligible
209	Single storey	Brick and corrugated metal	Flat roof	No	None identified	No	Negligible
210	Single storey	Brick and corrugated metal	Flat roof	Ventilation grids	None identified	No	Negligible
212	Single storey 30-50 years	Brick	Flat roof – metal sheeting	No	A few gaps between brickwork and flashing	No	Low
214	Single storey	Aluminium	Flat felt roof	No	Gap in felt visible from ground	No	Low to Negligible

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
215	Single storey	Plastic coating	Flat felt roof	No	Very well-sealed, no visible entry points at height. There are some gaps at in wall at around 1ft from the ground.	No	Negligible
216	Single storey 30 years	Cement, wood	Flat felt roof	Ventilation grids PVC windows	Broken grate has limited potential. West facing kick board has lots of gaps (potential access). Ventilation grate around roof has a crack Gaps where wall meets roof.	No	Low
217	Single storey	Composite	Composite	No	None identified	No	Negligible
221	Single storey	Brick	Flat roof	No	None identified	No	Negligible
224	Single storey	Brick, harling	Flat roof	No	Good potential access points in wall – 2 inch gap that goes into wider space in south facing wall.	No	Moderate
225	Two storey 30-50 years	Composite	Flat roof	Metal cased windows	None identified	No	Negligible
227	Two storey building	Brick	Metal	No	Vertical gaps in the corner between two buildings.	No	Low
228	Single storey, permanent portacabin building	Wood	Flat roof	No	Gaps (5-10cm wide) in the grate on the west side of the building (e.g. NS 18272 51397). Gaps are also under boards at NS 18272 51397.	No	Low
229	Permanent single storey portacabin	Plaster	Flat roof	PVC windows Ventilation grids	Several cracks in ventilation. Gap at end of wood cladding at roof.	No	Low
231	Single storey portacabin	Composite	Shallow pitched felt roof	No	Gap in roof on the south-west side of the building. Gap in grate on the south side of the building, measuring approximately 2cm wide by 4cm long (e.g. at NS 18493 51250).	No	Low
239	Single storey 30-50 years	Sprayed cement, wood	Flat roof	PVC Windows	Holes in wooden surround between top of wall and roof	No	Low to Negligible

Building reference (App. A)	Building summary (Storeys, age etc)	Wall construction	Roof construction	Notable external features	Potential bat roost/access (height & aspect)	Evidence of bat activity	Preliminary Roost Assessment (Roost suitability)
244	Single storey 30-50 years	Composite	Flat roof	Metal frame windows	None identified	No	Negligible
246	Single storey 1 year old.	Aluminium	Aluminium	No	None identified	No	Negligible
248	Single storey 30-50 years	Brick	Flat roof	No	Holes where cables enter building	No	Low
249	Single storey 30-50 years	Aluminium cladding	Aluminium	No	Small gap above fire exit	No	Negligible

Appendix E
Bat activity (static detectors)

Table E1 Spring (17th to 21st May 2019)

Static Detector Location (Figure 2.2)	No of nights' data	Number of recorded passes by each species (mean number[11])			
		Common pipistrelle	Soprano pipistrelle	Noctule	Nyctalus sp.
1	5	5 (1)	2 (0.4)	0	0
2	5	890 (178)	1367 (273)	0	0

Table E2 Summer (20th to 24th July 2019)

Static Detector Location (Figure 2.2)	No of nights' data	Number of recorded passes by each species (mean number)			
		Common pipistrelle	Soprano pipistrelle	Noctule	Nyctalus sp.
1	5	14 (2.8)	2 (0.4)	0	0
2	5	275 (55)	141 (28)	41 (8)	1 (0.2)

Table E3 Autumn (4th to 8th September 2019)

Static Detector Location (Figure 2.2)	No of nights' data	Number of recorded passes by each species (mean number)			
		Common pipistrelle	Soprano pipistrelle	Noctule	Nyctalus sp.
1	5	11 (2.2)	2 (0.4)	0	0
2	4	273 (68.2)	781 (195.2)	1 (0.2)	0

[11] Numbers in brackets are the mean number of bat passes over then monitoring period.

Table E4 Combined total over the monitoring period

Static Detector Location (Figure 2.2)	No of nights' data	Number of recorded passes by each species (mean number)			
		Common pipistrelle	Soprano pipistrelle	Noctule	Nyctalus sp.
1	15	30 (6)	6 (0.4)	0	0
2	14	1473 (105.2)	2289 (163.5)	42 (3)	1 (0.1)

Appendix F
Bat activity (transects)

Table F1 – Bat Activity – Spring (13th May 2019)

Site Name: HNB
Date: 13/05/19
Survey Type: Dusk transect
Sunset: 21:21
Survey Start: 21:17
Survey End: 23:39

Temperature: 16°C
Precipitation: None
Cloud cover: 0
Moon phase: Half moon
Wind speed/direction: Calm

REAL TIME (BST)	LOCATION	SPECIES	BATS (Max No.)	BATS (passes)	BEHAVIOUR	NOTES
22:18	NS 18775 51418	Soprano pipistrelle	1	1	Feeding	Heard only
22:24	NS 18655 51275	Soprano Pipistrelle	1	1		Heard only
22:33	NS 18651 51086	Common pipistrelle	1	1		Heard only
22:44	NS 18413 51092	Soprano Pipistrelle	1	1		Heard only
22:49	NS 18432 51033	Common pipistrelle	1	1		Heard only
23:05	NS 18794 51222	Soprano Pipistrelle	1	1		Heard only
23:11	NS 18650 51247	Soprano Pipistrelle	1	1		Heard only
23:11	NS 18647 51257	Soprano Pipistrelle	1	1		Heard only
23:15	NS 18670 51291	Soprano Pipistrelle	1	1		Heard only

Table F2 Bat Activity – Summer (22nd July 2019)

Site Name: HNB
Date: 22/07/19
Survey Type: Dusk transect
Sunset: 21:45
Survey Start: 21:55
Survey End: 00:15

Temperature: 18°C
Precipitation: None
Cloud cover: 50%
Moon phase: Not visible
Wind speed/direction: Light

REAL TIME (BST)	LOCATION	SPECIES	BATS (Max No.)	BATS (passes)	BEHAVIOUR	NOTES
22:20	NS 18671 51718	Soprano pipistrelle	1	1		Heard only
22:20	NS 18687 51700	Soprano pipistrelle	1	1		
22:20	NS 18692 51697	Soprano pipistrelle	1	Multiple	Feeding	Feeding alongside hedgerow at field edge.
22:21	NS 18692 51696	Soprano pipistrelle	1	1		Heard only
22:21	NS 18691 51698	Soprano pipistrelle	1	1	Commuting	Heard only
22:22	NS 18692 51695	Soprano pipistrelle	1	1	Commuting	Heard only
22:22	NS 18690 51697	Soprano pipistrelle	1	1	Commuting	Heard only
22:23	NS 18689 51697	Soprano pipistrelle	1	1	Commuting	Heard only
22:23	NS 18694 51697	Common pipistrelle	1	1	Commuting	Heard only
22:23	NS 18694 51695	Soprano pipistrelle	1	1	Commuting	Heard only
22:42	NS 18771 51242	Soprano pipistrelle	1	1	Commuting	Heard only
22:42	NS 18771 51242	Soprano pipistrelle	1	1	Commuting	Heard only

Site Name: HNB
Date: 22/07/19
Survey Type: Dusk transect
Sunset: 21:45
Survey Start: 21:55
Survey End: 00:15

Temperature: 18ºC
Precipitation: None
Cloud cover: 50%
Moon phase: Not visible
Wind speed/direction: Light

REAL TIME (BST)	LOCATION	SPECIES	BATS (Max No.)	BATS (passes)	BEHAVIOUR	NOTES
22:43	NS 18787 51229	Soprano pipistrelle	1	1	Commuting	Heard only
22:47	NS 18804 51148	Soprano pipistrelle	1	1	Commuting	Heard only
22:54	NS 18634 51092	Common pipistrelle	1	1	Commuting	Heard only
23:09	NS 18629 51097	Soprano pipistrelle	1	1	Commuting	Heard only
23:10	NS 18643 51108	Noctule	1	1	Commuting	Heard only
23:19	NS 18675 51236	Common pipistrelle	1	1	Commuting	Heard only
23:23	NS 18697 51323	Soprano pipistrelle	1	1	Commuting	Heard only
23:27	NS 18776 51417	Common pipistrelle	1	1	Feeding	
23:31	NS 18727 51523	Soprano pipistrelle	1	1	Commuting	

Table F3- Bat Activity – Autumn (16th September 2019)

Site Name: HNB
Date: 16/09/19
Survey Type: Dusk transect
Sunset: 19:34
Survey Start: 19:30
Survey End: 21:30

Temperature: 13 - 15°C
Precipitation: None
Cloud cover: 20%
Moon phase: Full moon
Wind speed/direction: Calm

REAL TIME (BST)	LOCATION	SPECIES	BATS (Max No.)	BATS (passes)	BEHAVIOUR	NOTES
20:13	NS 18688 51314	Common pipistrelle	1	1	Feeding	Single pass along edge of treeline
20:15	NS 18688 51314	Soprano pipistrelle	1	4	Feeding	Multiple passes along edge of treeline
20:27	NS 18376 51146	Pipistrelle sp	1	3	Feeding	-
20:40	NS 18504 51086	Nyctalus sp	1	2	-	-
20:41	NS 18442 51070	Soprano pipistrelle	1	1	-	-
20:58	NS 18644 51266	Pipistrelle sp	1	3	-	-

Appendix 8F: Baseline Report Breeding and Non-Breeding Birds

EDF Energy

Hunterston B Decommissioning EIA

Baseline Report: Breeding and Non-breeding Birds

Wood Environment & Infrastructure Solutions UK Limited –September 2020

Report for

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Management systems

This document has been produced by Wood Environment & Infrastructure Solutions UK Limited in full compliance with the management systems, which have been certified to ISO 9001, ISO 14001 and OHSAS 18001 by LRQA.

Document revisions

No.	Details	Date
1	Draft	April 2020
2	Final	September 2020

Contents

1. Introduction

1.1 Purpose of this report

EDF Energy proposes to start preparation for waste processing facilities (Operational and Decommissioning Waste) and waste stores (ILW Store) at Hunterston B to support decommissioning activities following the End of Generation (EoG), which is currently scheduled to be in 2023. Prior to the construction of these facilities, planning permission from the Local Planning Authority (LPA) under Town and Country Planning (Scotland) Act 1997 (TCPA) will be required. Other permissions and consents for the overall decommissioning project will be required separately under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning (EIAD)) Regulations, 1999, as amended, and EURATOM Article 37 (or an equivalent),

The current strategy is for an Environmental Impact Assessment to be undertaken and a single Environmental Statement (ES) to be prepared to assess the environmental impacts of the proposed decommissioning project under both the TCPA and EIAD Regulations. Other consents for specific activities will also be required and can draw on the EIAs.

This report sets out information about the bird surveys undertaken to inform the EIA of the HNB Decommissioning Project. It includes a brief description of the proposed HNB Decommissioning Project before setting out information about the bird survey methods, results and conclusions.

1.2 Scheme Description

Decommissioning at HNB is expected to commence in 2023. The Site location is shown in **Appendix A**, **Figure 1.1.** The decommissioning process will begin with the process of defueling and initial decommissioning, with spent fuel transferred to the Sellafield nuclear licensed site. Over approximately a 15-year period there will be a process of safe storage and management of intermediate and low-level waste, with intermediate-level waste stored temporarily on or near the site, in sealed and shielded containers within designed stores that have similar characteristics to industrial units, and low-level waste being transferred to appropriate treatment or disposal facilities. In parallel with these tasks, redundant buildings will be de-planted and demolished.

This initial decommissioning phase will include construction of waste processing facilities and a secure, weathertight, Safestore structure – a clad, steel framed structure based around the reactor building – will be constructed, to enclose the Advanced Gas-cooled Reactors, allowing the process of radioactive decay to reduce dose to significantly lower levels. The second phase of decommissioning – Care & Maintenance - will involve ongoing site/station care and maintenance over a period of approximately 70 years. The third phase will involve reactor building decommissioning and final site clearance involving site-wide demolition of the remaining buildings and remediation to an extent conforming to the applicable regulations at the time, followed by back-filling. Aside from the defueling and management of waste storage and decay processes, the site will operate similar to a conventional construction/demolition site.

1.3 Site Context

The HNB site ('The Site' or 'the Station') is in West Kilbride, North Ayrshire, situated on the Firth of Clyde. The centre of the station is at approximate National Grid Reference (NGR) NS 184 514 and the area that is subject to the Nuclear Site Licence (NSL) extends to approximately 30ha. The majority of the station is built structures and hard standing (mainly access and car parks). Hunterston A (HNA) is situated to the west of, and immediately adjacent, to HNB.

2. Methodology

2.1 Study Area

The Site includes the land inside the HNB double security fence and the additional land that is covered by the HNB Nuclear Site Licence (NSL). The Study Area includes the Site and the land within 100 m of the Site (and HNA), to include territories of birds that breed outside the Site and use habitats within the Site for foraging. The Study Area was extended for non-breeding birds to a 500 m (radius) perimeter area (buffer) around the Site (and HNA). The Study Area is marked on **Figure 2.1**, **Appendix A** and is defined on a precautionary basis to encompass those areas within which birds are most likely to be susceptible to the effects of the HNB decommissioning project.

2.2 Desk Study

A desk-based study was undertaken to collate and review existing information on ecological features that are known to occur, or have previously been recorded, on land within and surrounding the Study Area defined in **Section 2.1**. These features include sites designated for biodiversity conservation; habitats of importance for biodiversity conservation; and legally protected and/or otherwise important species (including birds). The desk study is detailed in a separate report (*Hunterston B Decommissioning – Baseline Report: Desk Study [Terrestrial Ecology*]). The elements of the desk study that are relevant to ornithology are summarised below and are expanded to include additional ornithology data.

The categories of ornithological features that could be significantly affected by the HNB Decommissioning Project are summarised below. These are the sites (designated for birds) and bird species that are of sufficient biodiversity conservation importance that impacts on them could result in significant effects:

- Statutorily designated biodiversity conservation sites of national and international importance (statutory biodiversity sites):
- Important bird species:
  - Species of principal importance for the conservation of biological diversity in Scotland - these species are included on the Scottish Biodiversity List[1] (SBL);
  - Bird species on the Birds of Conservation Concern (BoCC) Red List[2] (Eaton et al 2015).
- Legally protected bird species, including those species that are afforded enhanced protection through inclusion on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended in Scotland).

The area over which ornithological features may be subject to significant effects, as a result of the HNB Decommissioning Project, is referred to as the potential 'Zone of Influence' (Chartered Institute of Ecology

[1] The Scottish Biodiversity List is a list of plants, animals and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation (https://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL)

[2] Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A, Gregory, R.D. (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746

and Environmental Management ([CIEEM], 2018[3]), which varies for different ornithological features depending on their sensitivity to environmental change together with the nature of the proposed works. The extent of the desk-based study was therefore expanded around the Site on a precautionary basis, informed by the professional judgement of experienced ornithologists and good practice guidance (e.g. CIEEM, 2018):

- The locations of statutory biodiversity sites of ornithological importance within 10 km of the Site, extended to 20 km for sites of international importance (SPAs and Ramsar sites) and 200 km for sites of international importance for particularly mobile sea bird species, were obtained from the Multi-Agency Geographical Information for the Countryside (MAGIC) website[4]. Details of cited features of designated sites were obtained from the JNCC website[5] and Scottish Natural Heritage website[6];
- Data on breeding colonies/sites located within 10 km of the Site was extracted from the JNCC Seabird Monitoring Programme online database[7]; and
- Bird records and details of any non-statutory biodiversity sites of importance for the conservation of birds within 3 km of the Site were obtained from the South West Scotland Environmental Information Centre (SWSEIC).

This desk study also includes information from the following sources:

- Hunterston Integrated Land Management Plan (ILMP)[8], which includes details of bird species recorded within the Study Area;
- Ayrshire County Bird Reports (2014[9] and 2015-16[10]); and
- Wetland Bird Survey (WeBS) core count data obtained from the British Trust for Ornithology[11] (BTO) for survey sectors within 5 km of the Site.

The nomenclature in this report follows that of the British Ornithologists' Union (BOU) 2017. A list of the species referred to in this report (including scientific names) is included in **Appendix B**. Details of relevant legislation and policy pertaining to birds in Scotland (and the UK) is provided in **Appendix C**.

2.3 Breeding Bird Survey

Survey objectives

All UK breeding bird species are legally protected, with species listed on Schedules 1, 1A and A1 of the Wildlife and Countryside Act 1981 as amended in Scotland receiving additional protection from disturbance (**Appendix C**). A number of bird species are also identified by Scottish Ministers as Species of Principal Importance for the Conservation of Biodiversity in Scotland and as such are included on the SBL. The

[3] Chartered Institute of Ecology and Environmental Management (CIEEM). (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. Chartered Institute of Ecology and Environmental Management, Winchester.

[4] https://magic.defra.gov.uk/ (accessed 13 August 2019)

[5] https://jncc.gov.uk/our-work/list-of-spas/ (accessed 13 August 2019).

[6] https://sitelink.nature.scot/site/1228#features (accessed 13 August 2019).

[7] (http://archive.jncc.gov.uk/smp/help.htm#browsesites, accessed 13 August 2019).

[8] EDF Energy Nuclear Generation Ltd (2017). Hunterston Integrated Land Management Plan.

[9] Simpson, F.S. [ed] (2017). Ayrshire Bird Report 2014. Scottish Ornithologists' Club, Ayrshire Branch.

[10] Dick, A.M. [ed] (2019). Ayrshire Bird Report 2015 and 2016. Scottish Ornithologists' Club, Ayrshire Branch.

[11] https://app.bto.org/webs-reporting

potential effects of development on breeding bird species are therefore a material consideration in determining planning applications.

The purpose of the breeding bird survey was to collect data to describe the breeding bird community within the Study Area and estimate the number of territories/ breeding pairs of each species within this area. These surveys derive the baseline status of breeding birds within the Study Area, against which the predicted effects of the HNB Decommissioning Project on this group of species will be assessed. Where necessary the survey data will also inform plans to mitigate the effects of the HNB Decommissioning Project on birds.

Data collection locations

The survey targeted suitable habitats for breeding birds within the Study Area (**Figure 2.1, Appendix A**). Areas inside the double security fence were surveyed from its perimeter. Areas outwith the EDF landholding were surveyed from publicly accessible locations (e.g. footpaths, roads). The survey also covered potentially suitable nest sites for Schedule 1 bird species, for example tall, built structures within the Site are potentially suitable nest sites for peregrine. Both the breeding (100m perimeter) and non-breeding (500m perimeter) bird survey areas are marked on **Figure 2.1**.

Data collection methods

A territory mapping survey based on the BTO Common Bird Census (CBC) methodology (Marchant[12] and Gilbert *et al*[13]) was carried out throughout the Study Area between April and July 2019. Eight to ten survey visits are standard for long term monitoring of CBC sites, however where territory mapping is used to inform an assessment of potential environmental impacts, six visits are sufficient to determine the numbers and distribution of breeding bird territories.

The surveys were undertaken until midday (at the latest), in appropriate weather conditions (avoiding periods of strong wind and/or heavy rain). A different route was used by each surveyor on each survey visit to ensure that certain parts of the Study Area did not receive greater survey effort at certain times of day, recognising that there tends to be a decline in bird song later in the morning. The location of each bird detected (visually and/or aurally) was mapped using standard two-letter BTO Codes and bird activity was recorded using standard behaviour codes (Marchant, 1983).

Data analysis

Survey results were collated and analysed, including mapping indicative territory centre-points, across all survey visits. Territory mapping analysis was based on criteria adapted from Amar *et al.* 2006**.** The territory mapping involved an experienced ornithologist looking for spatial groupings of song and other registrations indicative of potential breeding. The presence of a singing/displaying bird, or a pair of birds in potential nesting habitat (in any location on two or more survey dates), were treated as signifying a breeding territory. This data was used to determine the number and distribution of species and overall breeding assemblage within the Study Area.

For breeding gulls and jackdaw, the number of breeding pairs was taken as the maximum number of pairs observed on the power station building roofs on any single visit. The territory locations were derived from a combination of each visit map (CBC methodology) and the locations do not represent specific nest locations. The term 'territory' applied in this report denotes that a pair of breeding birds was present, or that a male was holding territory in that area.

[12] Marchant, J.H. (1983). Common Birds Census instructions. BTO, Tring

[13] Gilbert, G., Gibbons, D.W., AND Evans, J. (1998). Bird Monitoring Methods. RSPB.

2.4 Non-breeding Bird Survey

Survey objectives

There is the potential for important numbers of non-breeding birds to occur within the Study Area, particularly along the coastline adjacent to the Site. The purpose of the non-breeding bird survey is to collect data on the type and level of use of the Study Area by non-breeding birds. Data was also collected on the type and frequency of potential bird disturbance events and the level of response by birds to these events. These surveys derive the baseline status of non-breeding birds within the Study Area, against which the predicted effects of the HNB Decommissioning Project on this group will be assessed. Where necessary these survey data will also inform plans to mitigate the effects of the HNB Decommissioning Project on birds.

Data collection location

The non-breeding bird survey targeted suitable habitats (terrestrial, intertidal and inshore waters) for non-breeding birds within approximately 500m of the Site, which were surveyed from an observation point that was selected to optimise views of the survey area. This 500m perimeter (and observation point) is marked on **Figure 2.1**, along with the breeding bird survey area.

Data collection methods

Distribution and abundance surveys

Two survey visits were undertaken each month from October 2019 to March 2020 inclusive (12 survey visits in total), each one completed on a single day. The two visits were approximately two weeks apart, where possible covering a high tide and low tide period respectively. At least one survey visit included a dawn period, and another, a dusk period. The surveys targeted the following:

- All waterbird and seabird species;
- All bird of prey species;
- All bird species listed on:
  - Annex I of the Birds Directive;
  - Scottish Biodiversity List; and
  - BoCC Red and Amber lists.
- Congregations of ten or more individuals of other species; and
- Other locally scarce species.

Where time permitted the presence of other, non-target species was recorded.

During each survey visit, the surveyor walked a series of transect routes throughout the Study Area, counting all target species observed, with areas inside the double security fence surveyed from its perimeter (**Figure 2.1, Appendix A**). Areas outwith the EDF landholding were surveyed from publicly accessible locations (e.g. footpaths, roads).

Each habitat compartment within the Study Area was assigned a unique number to which sightings of target species were attributed. Each habitat compartment covered a block of woodland, a single field (or group of small fields), a block of buildings and associated hard standing, a stretch of watercourse and/or a defined stretch of intertidal habitat. During each survey visit, details of the birds observed were recorded:

- Species code (BTO 1-2 letter code);
- Number of individuals;
- Habitat compartment (number);
- Habitat type (**Appendix D**);
- Activity code -
  - **a** - Feeding/foraging (on the ground or in the air),
  - **b** - Loafing or preening,
  - **c** – Roosting,
  - **d** - Commuting (flying over the area – but not aerial hunting),
  - **e** - Landed (seen to land within survey area, but activity thereafter not established),
  - **f** - Flushed (seen to take flight from within survey area, activity beforehand not established),
  - **Other** (specified by the observer);
- Notes - other relevant details, such as direction of flight, sex, age, disturbance events and bird responses and (time-permitting) a list of non-target species.

The locations of any congregations of birds on terrestrial and intertidal/inshore habitats (particularly groups of foraging or roosting waders/ wildfowl), were marked on the Field Recording Map.

Disturbance monitoring

As well as recording disturbance events observed during the distribution and abundance surveys, disturbance events and bird responses were monitored for a one hour period on each survey visit, from an Observation Point (**Figure 2.1, Appendix A**) that optimised views of intertidal habitats within the Study Area. Disturbance monitoring targeted all waterbird and seabird species excluding gulls, recognising that coastal areas often support important non-breeding assemblages of waders and waterfowl. All potential disturbance agents (PDAs) and responses by target species were recorded:

- Time of PDA;
- PDA code/disturbance stimuli (**Table 2.1**);
- Bird species;
- Number of individuals that responded;
- Distance range of responding birds to PDA (i.e. 200-300m);
- Level of response -
  - **Level 5** – Flushed (movement of > 500m),
  - **Level 4** - Flushed (movement of > 100m),
  - **Level 3** - Movement < 100m (e.g. within an area of mud, feeding or roosting area),
  - **Level 2** - Behavioural change (e.g. alarm call/posture, change in feeding/roosting activity),
  - **Level 1** - No response;
- Notes – e.g. where the birds flew to, duration of disturbance; activity beforehand.

The same details were recorded for birds that exhibited no response to a PDA (Level 1) within 500m of them (reduced to 200m for walkers with and without dogs, birdwatchers, joggers and cyclists) to determine any indication that birds are showing signs of habituation to disturbance.

Table 2.1 Disturbance stimuli

PDA Code	Stimuli description
HUMAN RECREATION	
WD	Walker(s) with controlled dogs(s) in close proximity, on or off-lead
UN	Uncontrolled dog(s) – off-lead
WK	Walker(s) without dogs
BW	Birdwatcher(s)
JO	Jogger(s)
FI	Fishermen
BD	Bait digger(s)
HR	Horse-rider(s)
CY	Cyclist(s)
KS	Kite or wind surfer(s)
VESSELS	
LB	Large boat/ ship
SB	Speed boat
JS	Jet-ski
SA	Sailing boat or other small craft (not speed boat)
AIRCRAFT	
AC	Large commercial jet (under 1,000m)
LA	Light aircraft (under 1,000m)
ML	Micro-light
HC	Helicopter (under 1,000m)
OTHER STIMULI	
TD	Tidal disturbance: natural response to rising tide (i.e. birds reacting to the incoming tide and rising water levels with no other disturbance visible)
VE	Any vehicle (e.g. car, tractor, quad bike)
CN	Construction noise
GN	Gun-shot (rough soothing, wildfowling, organised shoot)

PDA Code	Stimuli description
PD	Disturbance from a predator (e.g. fox, peregrine, merlin etc).
UN	Unknown disturbance (e.g. when a flock flies/ reacts without any perceived disturbance)
OT	Other identified disturbance stimuli type.

2.5 Constraints

Breeding bird survey

The CBC method identifies numbers of territory-holding birds during the breeding season and does not confirm that breeding has taken place at locations within the Study Area, which would require nests with eggs/young to be identified for many species. The latter is not required to inform the EIA.

Disturbance monitoring

Quantifying background disturbance is difficult as around 29% of all disturbance events were recorded as having an unknown cause. Some predatory events may have gone undetected and the origin of other disturbance events may simply have been a result of a nervous flock responding to conspecifics taking flight or alarming in response to no specific stimulus. It is also the case that it is more likely that a surveyor would record an event that causes birds to take flight (level 3-5 responses) as they are more obvious than an event that would cause birds to become alert or offer no response at all (level 1 and 2 responses).

3. Results

3.1 Desk Study

Designated biodiversity sites (ornithological importance)

There are no statutory biodiversity sites designated for birds within 10 km of the Site. There are two statutory sites (designated for birds) of international importance within 20 km (**Figure 3.1, Appendix A**):

- **Renfrewshire Heights SPA** and SSSI (covering 8,498 ha) is 11.5 km north-east of the Site and is designated for its breeding population of hen harrier (averaging 10 breeding females during 1998-2004); and
- **Arran Moors SPA** (covering 10,802 ha) is 17.3 km west of the Site and is designated for its breeding population of hen harrier (averaging 24 breeding females and representing at least 4.8% of the breeding population in Great Britain (1998 National Survey).

There are 13 SPAs within 200 km of the Hunterston B site that contain marine seabird qualifying features: Ailsa Craig, Laggan, North Colonosay and Western Cliffs, Rathlin Island, Sheep Island, Larne Lough, Treshnish Isles, Rum, Canna and Sanday, Outer Ards, Strangford Lough, Belfast Lough. The foraging range of qualifying features from three sites overlap the Study Area, however these species primarily forage in the wider offshore environment, beyond the marine elements of HNBs infrastructure:

- **Ailsa Craig SPA** is approximately 51 km to the south-west and the foraging range of two of its qualifying features (breeding gannet and lesser black-backed gull) overlap the Study Area;
- **Rathlin Island SPA** is approximately 91 km to the south-west and the foraging range of six of its qualifying features (breeding common guillemot, fulmar, herring gull, lesser black-backed gull, manx shearwater and puffin) overlap with the Study Area; and
- **Rum SPA** is 154 km to the north-west and the foraging range of a single qualifying feature (breeding manx shearwater) overlaps the Study Area.

There are no non-statutory biodiversity sites designated specifically because of their ornithological importance within 3km of the Site.

Species records and monitoring data

Breeding Bird Surveys (EDF)

Breeding bird surveys were undertaken within the EDF landholding at Hunterston B in 2002, 2003 and 2011, and have been completed biennially since 2015. In 2019 (the most recent survey for which results are currently available), five survey visits were carried out from April-June. **Table E.1 (Appendix E)** summarises the number of territories/ breeding pairs recorded within the EDF landholding at HNB since 2011.

Non-breeding Bird Surveys (EDF)

Monthly (October 2018 to March 2019) non-breeding bird surveys were undertaken within the EDF landholding at Hunterston B by Clyde Ecology Ltd. This represents the third set of winter surveys, with previous surveys having been completed during the winters of 2014-15 and 2016-17 respectively. **Table E.2 (Appendix E)** shows the peak count of each species recorded within the EDF landholding at HNB in Winter 2018/19.

Seabird Monitoring Programme (JNCC)

The Seabird Monitoring Programme (SMP) is an ongoing annual monitoring programme, established in 1986, of 25 species of seabird that breed regularly in Britain and Ireland. **Table E.3 (Appendix E)** summarises the SMP counts of breeding seabird species (in pairs) for colonies within 10 km of the Site. The colonies are shown in order of their approximate distance from the Site boundary to the centre of the colony. The number of pairs is shown for the period in which the last full seabird census was carried out in 1998-2002 (Mitchell *et al.*, 2004) and any counts undertaken in the past five years (since 2014).

SWSEIC Data

SWSEIC hold a large number of records of bird species, including species of conservation concern, potentially within or close to the Site since 2009. **Table E.4 (Appendix E)** summarises the records of species of notable conservation status[14], potentially occurring within/near the Site (within NGR 1km square NS1851 or 2km tetrad square NS15V) since 2009, split by breeding season (April-July) and non-breeding season (August-March).

Wetland Bird Survey

The Wetland Bird Survey (WeBS) is the monitoring scheme for non-breeding waterbirds in the UK (coordinated by the BTO), which aims to provide the principal data for the conservation of their populations and wetland habitats. **Table E.5** (**Appendix E**) summarises average peak counts of bird species by count sector within 5km of the Site. A 5-year mean figure is used where available, although for some count sectors only a shorter timeframe is available. Any species that was recorded singly only once over the 5-year period is excluded. **Figure 3.2** shows the location of the WeBS count sectors within 5km of the Site.

3.2 Breeding Bird Survey

The survey parameters (dates, times and weather conditions) are included in **Table F1, Appendix F**. A total of 52 species were recorded during the breeding bird survey and there was evidence of breeding/holding territory within the Study Area by 27 of these species (**Figure 3.3a**, **Figure 3.3b** and **Table 3.1**):

- Lesser black-backed gull, a qualifying feature of Ailsa Craig SPA and Rathlin Island SPA for its breeding populations, was recorded breeding on the Site;
- Herring gull, a qualifying feature of Rathlin Island SPA for its breeding population, was recorded breeding on the Site;
- No species listed on Annex I of the Birds Directive;
- No species listed on Schedule 1 of the Wildlife & Countryside Act 1981 as amended in Scotland;
- Six species on the Scottish Biodiversity List (dunnock, herring gull, house sparrow, linnet, reed bunting and song thrush);
- Four species listed on the Birds of Conservation Concern (BoCC) red-list (Eaton et al., 2015) (herring gull, house sparrow, linnet and song thrush); and

[14] Species listed in the Wildlife & Countryside Act 1981 as amended in Scotland (on Schedules 1, 1A and A1), Annex I of the Birds Directive, the Scottish Biodiversity List and BoCC red-list (Eaton *et al.*, 2015).

- Seven species on the BoCC Amber-list (dunnock, house martin, lesser black-backed gull, meadow pipit, oystercatcher, reed bunting and willow warbler).

The number of breeding pairs of herring gull, lesser black-backed gull and jackdaw breeding on the power station buildings (within the Study Area) was estimated from the maximum number of pairs seen on any single visit (**Table G1, Appendix G**).

Table 3.1 Breeding bird territories recorded within the Study Area (2019)

BTO species code	Species	No. territories within Study Area	Scottish Biodiversity List	BoCC (Red/Amber)
B.	Blackbird	8		
BT	Blue tit	4		
C.	Carrion crow	1		
CH	Chaffinch	4		
CT	Coal tit	1		
CD	Collared dove	1		
D.	Dunnock	3	Yes	Amber
GO	Goldfinch	3		
GT	Great tit	2		
HG	Herring gull	12	Yes	Red
HM	House martin	1		Amber
HS	House sparrow	7	Yes	Red
JD	Jackdaw	10		
LB	Lesser Black-backed gull	6		Amber
LI	Linnet	2	Yes	Red
MG	Magpie	2		
MP	Meadow pipit	3		Amber
OC	Oystercatcher	2		Amber
PW	Pied wagtail	3		
RB	Reed bunting	1	Yes	Amber
R.	Robin	4		
SW	Sedge warbler	2		
ST	Song thrush	1	Yes	Red

BTO species code	Species	No. territories within Study Area	Scottish Biodiversity List	BoCC (Red/Amber)
WH	Whitethroat	1		
WW	Willow warbler	5		Amber
WP	Woodpigeon	1		
WR	Wren	5		

A further 25 species were recorded during the breeding bird survey for which no evidence of breeding/ holding territory was recorded. The total number of each non-breeding species recorded on each visit is included in **Table G.2 (Appendix G)**. All of these species breed in Ayrshire (Simpson [ed], 2017) and the Study Area provides potentially suitable breeding habitat for a number of them:

- **Built areas**: kestrel, starling, stock dove and swallow;
- **Trees and scrub:** blackcap, mistle thrush and pheasant; and
- **Grassland and coastal habitat:** wheatear, shelduck and eider.

3.3 Non-breeding Bird Survey

Distribution and Abundance

The survey parameters (dates, times and weather conditions) are included in **Table F.2 (Appendix F)**. A total of 8,386 individuals across 80 species were recorded during the non-breeding bird survey (**Table H.1, Appendix H**). The majority (73%) of species observations were within habitat compartments 2, 3 and 10, which are coastal habitats (**Figure 2.1** and **Table 3.2**). There was only a single bird recorded in each of habitat compartment numbers 26, 32 and 33 (improved and semi-improved grassland). Bird activities within the Study Area primarily consisted of feeding and foraging, loafing and roosting.

Table 3.2 Habitat compartments with the highest numbers of non-breeding bird observations*

Habitat compartment (Figure 2.1)	Total observations*	% of all observations	Feeding / foraging (total)	Loafing (total)	Roosting (total)
2	311	36.33	105	67	49
10	255	29.79	136	10	92
3	58	6.78	8	5	34
11	31	3.62	24	2	5
14	28	3.27	17	2	5
18	23	2.69	11	1	5
4	20	2.34	3	1	1

Habitat compartment (Figure 2.1)	Total observations*	% of all observations	Feeding / foraging (total)	Loafing (total)	Roosting (total)
19	14	1.64	6	3	4
7	13	1.52	11	1	-
9	12	1.40	9	-	-

* Each observation is a record of a species on single survey date, for example a record of 5 herring gulls and 6 lesser black-backed gulls on a single survey date, followed by 7 and 9 respectively on the next survey date, would represent a total of four observations.

A total of 55 target species were recorded:

- **Seven** species are listed on Annex I of the Birds Directive (bar-tailed godwit, dunlin, golden plover, peregrine, red-throated diver, shag and whooper swan);
- **Twenty** species are on the Scottish Biodiversity List (bar-tailed godwit, black-headed gull, bullfinch, dunlin, dunnock, golden plover, herring gull, house sparrow, kestrel, lapwing, linnet, peregrine, red-throated diver, redwing, reed bunting, skylark, song thrush, starling, twite and whooper swan);
- **Fifteen** species are listed on the Birds of Conservation Concern (BoCC) red-list (curlew, fieldfare, grey wagtail, herring gull, house sparrow, lapwing, linnet, mistle thrush, redwing, ringed plover, shag, skylark, song thrush, starling and twite); and
- **Twenty-nine** species are on the BoCC Amber-list (black guillemot, black-headed gull, bullfinch, common guillemot, common gull, dunlin, dunnock, eider, goldeneye, great black-backed gull, greenshank, greylag goose, kestrel, knot, lesser black-backed gull, mallard, meadow pipit, mute swan, oystercatcher, redshank, reed bunting, shelduck, snipe, stock dove, teal, turnstone, whooper swan and wigeon).

Details of the monthly peak counts of target species and the habitat compartments where the peak counts were recorded are presented in **Table 3.3.**

Table 3.3 Peak monthly counts of target species and location (habitat compartment)

BTO code	Species	Conservation status	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
BA	Bar-tailed godwit	Annex 1, SB, Amber	1 (10*)					
TY	Black guillemot	Amber	4 (2)	2 (4)		5 (2)	6 (2)	9 (2)
BH	Black-headed gull	SB, Amber	9 (10)	20 (10)	35 (10)	17 (10)	11 (10)	6 (10)
BF	Bullfinch	SB, Amber				X		
BZ	Buzzard		2 (21)	1 (12/18/19/27)	1 (12/18/19/27)	1 (11/16/19/29)	1 (14/19/21)	2 (30)
LQxBY	Cackling x barnacle goose hybrid						1 (11)	
CG	Canada goose					2 (14)	13 (11)	4 (11)
GU	Common guillemot	Amber				2 (2)		
CM	Common gull	Amber	150 (33)	28 (22)	34 (10)	34 (11)	75 (18)	26 (18/27)
CA	Cormorant		21 (2)	14 (2)	3 (2)	3 (2)	4 (2)	2 (2)
CU	Curlew	Red	35 (10)	45 (10)	25 (10)	42 (14)	33 (18)	33 (33)
DN	Dunlin	Annex 1, SB, Amber	23 (10)	14 (3)	7 (10)	85 (10)	22 (3)	
D.	Dunnock	SB, Amber	x	x	x	x	x	x
E.	Eider	Amber	4 (2)	4 (2)	2 (2)	9 (2)	13 (2/5)	80 (2)
FF	Fieldfare	Red	x		x	15 (16)	30 (19)	x
GP	Golden plover	Annex 1, SB			1 (10)			
GN	Goldeneye	Amber				1 (2)		
GB	Great black-backed gull	Amber	3 (2)	2 (2)	1 (2)	2 (2/10)	2 (2)	2 (2)
GK	Greenshank	Amber				1 (10)		

BTO code	Species	Conservation status	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
H.	Grey heron		2 (4/29)	2 (10)	2 (14)	1 (2/3/10)	1 (2/3/10)	
GL	Grey wagtail	Red	2 (27)			1 (3)		
GJ	Greylag goose	Amber	23 (4)	42 (14)	87 (14)	65 (18)	37 (11)	18 (14/15)
HG	Herring gull	SB, Red	11 (4)	14 (10)	6 (7)	13 (10)	18 (11)	7 (5/14)
HS	House sparrow	SB, Red		x	x	x	x	
K.	Kestrel	SB, Amber	1 (4)	1 (20/27)	1 (27)	1 (4/31)	1 (27)	1 (29)
KN	Knot	Amber	80 (10)				1 (3)	
L.	Lapwing	SB, Red					18 (26)	15 (18)
LB	Lesser black-backed gull	Amber					1 (11)	8 (18)
LI	Linnet	SB, Red	35 (4)	15 (9)	x			x
ET	Little egret			1 (10)	1 (10)	1 (10)	1 (2)	1 (10)
MA	Mallard	Amber	23 (2)	22 (2)	8 (2)	20 (2)	22 (2)	14 (2)
MP	Meadow pipit	Amber	x	30 (27)	x	x	x	x
M.	Mistle thrush	Red	x	x	x	x	x	x
MS	Mute swan	Amber	4 (2)	7 (2)		2 (2)	2 (2)	
OC	Oystercatcher	Amber	53 (10)	65 (3)	80 (10)	155 (3)	84 (3)	37 (3)
PE	Peregrine	Annex 1, SB		1 (1)	2 (2)			1 (10)
RM	Red-breasted merganser		17 (2)	2 (2)	4 (2)	6 (2)	3 (2)	2 (2)
RK	Redshank	Amber	14 (10)	10 (10)	7 (10)	13 (10)	5 (3)	6 (10)
RH	Red-throated diver	Annex 1, SB				2 (2)		
RE	Redwing	SB, Red	x	25 (11)	x	30 (16)	50 (19)	70 (16)

BTO code	Species	Conservation status	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
RB	Reed bunting	SB, Amber		x	x	x	x	x
RP	Ringed plover	Red				12 (10)	2 (3)	
SA	Shag	Annex 1, Red	4 (2)	17 (2)	14 (2)	23 (2)	15 (2)	9 (2)
SU	Shelduck	Amber	2 (2/10)	30 (10)	29 (10)	23 (10)	21 (2)	23 (10)
S.	Skylark	SB, Red						x
SN	Snipe	Amber		3 (4)	4 (4)	1 (4)	1 (4)	
ST	Song thrush	SB, Red	x	x	x	x	x	x
SH	Sparrowhawk			1 (4)	1 (18/19)			1 (19/32)
SG	Starling	SB, Red	60 (18)	x	x	22 (18)	50 (29)	45 (9)
SD	Stock dove	Amber						x
T.	Teal	Amber		22 (13)	17 (13)	28 (13)	24 (13)	25 (13)
TT	Turnstone	Amber		55 (2)	75 (2)	4 (3)	4 (4)	7 (2)
TW	Twite	SB, Red			14(4)			
WS	Whooper swan	Annex 1, SB, Amber	2 (2)					
WN	Wigeon	Amber	165 (2)	200 (2)	75 (2)	18 (2)	25 (2)	28 (2)

Annex I = Annex I of the Birds Directive; SB = Scottish Biodiversity List; Red / Amber = BoCC red / amber listed species

Blank cells = not recorded; x = present but no peak count recorded; * = numbers in brackets denote the habitat compartment number (Figure 2.1) where the peak monthly counts were recorded.

Table 3.4 compares the peak survey counts of 15 target species that had peak counts of over 10 individuals and were also recorded on 9 (75%) or more survey visits, with the highest five-year (2014/15 to 2018/19) mean peak counts (non-breeding) of these species (**Table E.5, Appendix E**) from six WeBS sectors within 5km of the Site (**Figure 3.2**). The previous peak single count of each species, for any location across Ayrshire, submitted to the Ayrshire Bird Club (Dick [ed] 2019), along with Scottish non-breeding population estimates (Forester et al 2007[15]), are also included in Table 3.4 as indicators of previous county and national population estimates.

The peak survey counts for 14 of the 15 species included in Table 3.4 are lower or comparable to the highest five-year mean peak WeBS counts (non-breeding) of these species within 5km. Although the peak count for greylag goose is notably high, this count is <0.1% of the estimated Scottish wintering population.

Table 3.4 Species with a peak count of >10 that were also recorded on nine (75%) or more survey visits

Species	Peak survey count	Highest mean peak WeBS count within 5km	Peak count as % of highest mean peak WeBS count within 5km	Ayrshire peak count: non-breeding (2016)	Scottish population estimate - non-breeding (2007)
Black-headed gull	35	220	16	500	155,500
Common gull	150	640	23	570	79,700
Cormorant	21	37	95	50	9,000-11,500
Curlew	45	421	11	150	85,700
Eider	80	280	55	250	64,500
Greylag goose	87	32	272	670	85,000+
Herring gull	18	35	72	800	91,000
Mallard	23	196	22	123	65,000-90,000
Oystercatcher	155	519	30	178	80,000-120,000
Red-breasted merganser	17	41	41	40	8,500
Redshank	14	108	22	197	4,000-25,000
Shag	23	54	43	59	60,000-80,000
Shelduck	30	124	24	30	7,000
Teal	28	108	26	300	37,500
Wigeon	200	398	50	700	76,000-96,000

[15] Forrester, R.W. & Andrews, I.J. 2007. The Birds of Scotland. Scottish O30rnithologist Club, Aberlady.

Disturbance monitoring

Background disturbance

The results of disturbance monitoring are summarised in **Table 3.5**. In the event two potential disturbance stimuli were noted, the bird data relate to the first stimulus that was recorded.

Table 3.5 Disturbance monitoring results

Disturbance stimulus	Number of events (Levels 1-5)	Number of bird responses (Level 2-5)	Average number of responses (Level 2-5)
Unknown	17	421	24.76
Predator (e.g. fox, peregrine, merlin etc).	15	312	20.80
Sailing boat or other small craft	12	200	16.66
Walkers with un-controlled dogs off lead	6	192	32.00
Tidal disturbance: natural response to rising tide	4	95	23.75
Other	1	80	80.00
Bait diggers	13	49	4.08
Vehicle	12	29	2.41
Speed boat	5	1	0.20
Walkers with controlled dogs – on/off lead	6	0	0.00
Construction noise	2	0	0.00
Total	**93**	**1,379**	

With the exclusion of 'unknown' stimuli, the most frequent disturbance events were associated with:

- Predators (20%);
- Bait diggers (17%); and
- Sailing boat or other small craft, and vehicles (16%).

The largest numbers of birds (with the exclusion of 'unknown' stimuli) were disturbed by:

- Predators (33%);
- Sailing boats and other small craft (21%); and
- Walkers with un-controlled dogs (20%).

A single 'other' disturbance event was caused by a low flying heron across the intertidal zone.

On average the largest numbers of birds responding to a single disturbance event (with the exclusion of 'unknown' and 'other' reasons) were disturbed by:

- Walkers with un-controlled dogs (32);
- Tidal activity (23.75); and

- Predators (20.80).

Disturbance responses

Level 4 and 5 responses are considered to equate most closely to significant disturbance (**Table 3.6**). A total of 7 Level 4 disturbance events and 35 Level 5 events comprised 45.16% of all recorded disturbance events.

Table 3.6 Level 4 and 5 disturbance events.

Visit Date	Level 4 Events		Level 5 Events	
	Total number of events recorded	Total number of individual responses	Total number of events recorded	Total number of individual responses
October 2019	3	46	14	195
November 2019	1	40	3	103
December 2019	1	4	11	218
January 2020	2	13	-	-
February 2020	-	-	2	44
March 2020	-	-	5	89

A total of 13 species exhibited a Level 4 or 5 response (black-headed gull, curlew, dunlin, greylag goose, heron, knot, mallard, oystercatcher, redshank, red-breasted merganser, shelduck, teal and wigeon) as summarised in **Table 3.7**.

Table 3.7 Level 4 and 5 disturbance responses

Species	Total number of individual responses (at all levels) caused by all stimuli	Number of birds showing level 4 responses	Number of birds showing level 5 responses	Most common disturbance stimuli (excluding unknown)
Black-headed gull	7	5	-	Bait diggers
Curlew	71	10	45	Predators, uncontrolled dogs and tidal influence
Dunlin	30		30	Bait diggers and small vessels
Greylag goose	105	7	-	Bait diggers, un-controlled dogs and dog walkers with controlled dogs
Heron	1	1	-	Bait diggers
Knot	240	-	80	Unknown and low flying heron
Mallard	6	-	6	Predators
Oystercatcher	314	-	312	Predators and tidal influence

Species	Total number of individual responses (at all levels) caused by all stimuli	Number of birds showing level 4 responses	Number of birds showing level 5 responses	Most common disturbance stimuli (excluding unknown)
Redshank	16	-	16	Predators and bait diggers
Red-breasted merganser	1	-	1	Unknown
Shelduck	33	-	8	Predator and bait diggers
Teal	8	-	8	Unknown
Wigeon	451	80	143	Small sailing and other vessels, predator

4. Conclusions

4.1 Current Baseline

Breeding Birds

The breeding bird community within the Study Area primarily comprises low numbers of common and widespread species (Dick [ed] 2019, Simpson [ed] 2017) that are typical of the county (Ayrshire) and the habitats present (scrub, trees, hedgerows and manmade structures).

Breeding lesser black-backed gulls are a qualifying feature of both Ailsa Craig SPA and Rathlin Island SPA. Although the Study Area is within the potential foraging range of these SPA populations it is not designated as part of either of the SPAs, therefore the birds breeding within the Study Area are not functionally linked to SPA populations. Similarly, breeding herring gulls are a qualifying feature of Rathlin Island SPA and the Study Area is within the potential foraging range of this SPA population, however the herring gulls breeding within the Study Area are not functionally linked to the SPA population for the same reason.

No species listed on Schedules 1, 1A or A1 of the Wildlife and Countryside Act 1981 (as amended in Scotland) were recorded breeding within the Study Area. The desk study did not identify any records of hen harrier (qualifying feature of Renfrewshire Heights SPA and Arran Moors SPA) within 3 km of the Site and this species, which in the British Isles nests and roosts on open/upland moors, was not recorded during the surveys, recognising that the habitats within the Study Area are unlikely to attract this species.

Breeding (or potentially breeding) pairs/territories of six species, which are either listed on the Scottish Biodiversity List or BoCC Red List (Eaton *et al*., 2015), were recorded within the Study Area: dunnock (3), herring gull (12), house sparrow (7), linnet (2), reed bunting (1) and song thrush (1). Herring gull nest on the roofs of the power station buildings, house sparrow also breed in the built areas and the remaining species are associated with scrub and woodland habitats, mainly outside of the HNB security fence. These breeding pairs are likely to represent less than 1% of the respective Ayrshire populations.

Non-breeding Birds

Distribution and abundance

The non-breeding bird assemblages within the Study Area primarily comprise a range of species associated with coastal habitats and over-wintering farmland birds. A total of 55 target species were recorded:

- Seven of these species are listed on Annex I of the Birds Directive (bar-tailed godwit, dunlin, golden plover, peregrine, red-throated diver, shag and whooper swan);
- Twenty species are on the Scottish Biodiversity List (bar-tailed godwit, black-headed gull, bullfinch, dunlin, dunnock, golden plover, herring gull, house sparrow, kestrel, lapwing, linnet, peregrine, red-throated diver, redwing, reed bunting, skylark, song thrush, starling, twite and whooper swan);
- Fifteen species are listed on the Birds of Conservation Concern (BoCC) red-list (curlew, fieldfare, grey wagtail, herring gull, house sparrow, lapwing, linnet, mistle thrush, redwing, ringed plover, shag, skylark, song thrush, starling and twite); and
- Twenty-nine species are on the BoCC Amber-list (black guillemot, black-headed gull, bullfinch, common guillemot, common gull, dunlin, dunnock, eider, goldeneye, great black-backed gull, greenshank, greylag goose, kestrel, knot, lesser black-backed gull, mallard, meadow pipit, mute

swan, oystercatcher, redshank, reed bunting, shelduck, snipe, stock dove, teal, turnstone, whooper swan and wigeon).

The temporal and spatial distribution of peak counts of non-breeding birds is summarised in **Table 3.3**, with the most notable areas in terms of bird species and numbers being associated with intertidal and near-shore habitats (habitat compartments 2, 3 and 10, **Figure 2.1**). These areas are primarily used by birds that are feeding and foraging, loafing and roosting.

The peak counts of 14 of the 15 target species that had peak counts of over 10 individuals and were also recorded on 9 (75%) or more survey visits, are lower or comparable to the highest five-year mean peak WeBS counts (non-breeding) within 5km of the Site. Although the peak survey count for greylag goose is notably high compared to the five-year mean peak WeBS counts within 5km, this count is <0.1% of the estimated Scottish non-breeding population (Forester *et al*, 2007).

All other species were not recorded regularly enough, or in sufficient numbers, within the Study Area to be considered populations/assemblages of notable nature conservation importance.

Disturbance

The most common disturbance stimuli recorded within the intertidal habitats within the Survey Area were predators, bait digging, vehicles and sailing vessels and other small craft. The greatest disturbance responses by birds were associated with the presence of predators, sailing vessels and other small craft and walkers with uncontrolled dogs.

The five wildfowl species in **Table 3.7** (greylag goose, mallard, shelduck, teal and wigeon) were most commonly disturbed by sailing vessels and other small craft, predators, bait diggers and dogs.

Of the five wader species in **Table 3.7** (curlew, dunlin, knot, oystercatcher and redshank), the three most common disturbance stimuli were predators, tidal activity and bait diggers. Knot also responded to low flying heron.

Appendix A Figures


217000
218000
219000
220000
221000
653000
652000
651000
650000
Hunterston Construction Yard
Jetty
Black Rock
Ore Terminal
Hunterston Ore Terminal
Southannan Mains
Allan Wood
Glenside
Castle Hill Homestead
The Glen
Reservoir
Brigurd Point
Hunterston Sands
Inner Brigurd Point
Shore Cottage
Gull's Walk
Poteath
Poteathbank Cottage
Ayrshire Coastal Path
Hillhouse
Stoney Port
Landing Stage
Biglies Farm
Biglees Hill
Hunterston House
Hunterston Castle
Kilruskin Wood
Little Brigurd
HUNTERSTON 'A'
Hunterston Nuclear Generating Station
Goldenberry
Resr
Burn Gill
Campbelton
Campbelton Hill
North Kilruskin
Kilruskin Bridge
Castle Knowe
South Kilruskin
Pier
Hawking Craig
Blue Stones
Goldenberry Hill
Millstonford Bridge
Highthorn Bridge
The Three Sisters
Ardneil Hill
Thirdpart
Millstonford
Bushglen Bridge
Bushglen
Jenny's Dyke
Waterside Hill
Thirdpart Holdings
Carlung Farm
Northbank
Thicket Plantation
A 78
B 782
17
18
19
20
21
50
51
52
53

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence

0 250 500 750 m

Scale at A3: 1:15,000

Hunterston B Decommissioning EIA
Baseline Report: Breeding and Non-breeding Birds

Figure 1.1
Site location

September 2020

wood.

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217500 218000 218500 219000

652000 651500 651000

N

Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Breeding bird survey area
- Non-breeding bird survey area
- Observation point (non-breeding bird survey)

Habitat compartments (non-breeding bird survey)

1, Urban / buildings (Hunterston B)
2, Sea
3, Rocky beach
4, Unimproved grassland / scrub
5, Urban / buildings
6, Urban / buildings
7, Amenity grassland
8, Urban / buildings
9, Unimproved grassland / scrub
10, Mudflats (tidal)
11, Improved grassland / pasture (sheep)
12, Unimproved grassland
13, Pond
14, Improved grassland / pasture (sheep)
15, Improved grassland / pasture
16, Deciduous woodland
17, Improved grassland / pasture
18, Improved grassland/pasture (sheep & cattle)
19, Deciduous woodland
20, Improved grassland / pasture
21, Deciduous woodland
22, Improved grassland / pasture
23, Improved grassland / pasture (sheep)
24, Semi-improved grassland
25, Unimproved grassland / scrub (cattle)
26, Semi-improved grassland
27, Semi-improved grassland
28, Deciduous woodland
29, Improved grassland / pasture
30, Deciduous woodland
31, Semi-improved grassland
32, Semi-improved grassland
33, Improved grassland / pasture
34, Deciduous woodland

0 100 200 300 m

Scale at A3: 1:6,500

Hunterston B Decommisioning EIA
Baseline Report: Breeding and Non-breeding Birds

Figure 2.1
Study area

September 2020

wood.

Hunterston B Decommisioning EIA
Baseline Report: Breeding and Non-breeding Birds

Figure 3.1
Statutory biodiversity sites (ornithological importance)

September 2020

wood.

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215000

220000

655000

650000

72455

72453

72450

72452

72434

72457

72456

72082

72432

72431

72146

B896

B899

A78

B781

B782

B7048

B7047

Great Cumbrae Island

Gourd Hill

Play Hill

Minister's Hill

Millport

Aird Hill

Craigengour Hill

Auchenhary Hill

Fairlie

Craig Hill

Ward Hill

Fairlie Glen

Lairdside Hill

Diamond Hill

Southannan Sands

Kaim Hill

Black Hill

Hill of Hills

Lighthouse Hill

Bigeedmore

Green Hill

Glentane Hill

Caldron Hill

Crosbie Hills

Greenside Hill

Campbelton Hill

Ardneil Hill

Waterside Hill

Glenton Hill

Auld Hill

Creek Hill

Drummilling Hill

Law Hill

Blackshaw Hill

West Kilbride

Meadowfoot

North Hill or Knockewart

Aiknut Hill

Haupland Muir

South Hill

Tarbert Hill

Seamill

Hinglie Hill

Kirkland Glen

Key

Hunterston B Nuclear Site Licence boundary

Double security fence

5km search area around the Site

WeBS (Wetland Bird Survey) Sectors

0 500 1,000 1,500 2,000 m

Scale at A3: 1:40,000

Hunterston B Decommisioning EIA
Baseline Report: Breeding and Non-breeding Birds

Figure 3.2
WeBS (Wetland Bird Survey) Sectors within 5km

September 2020

wood.

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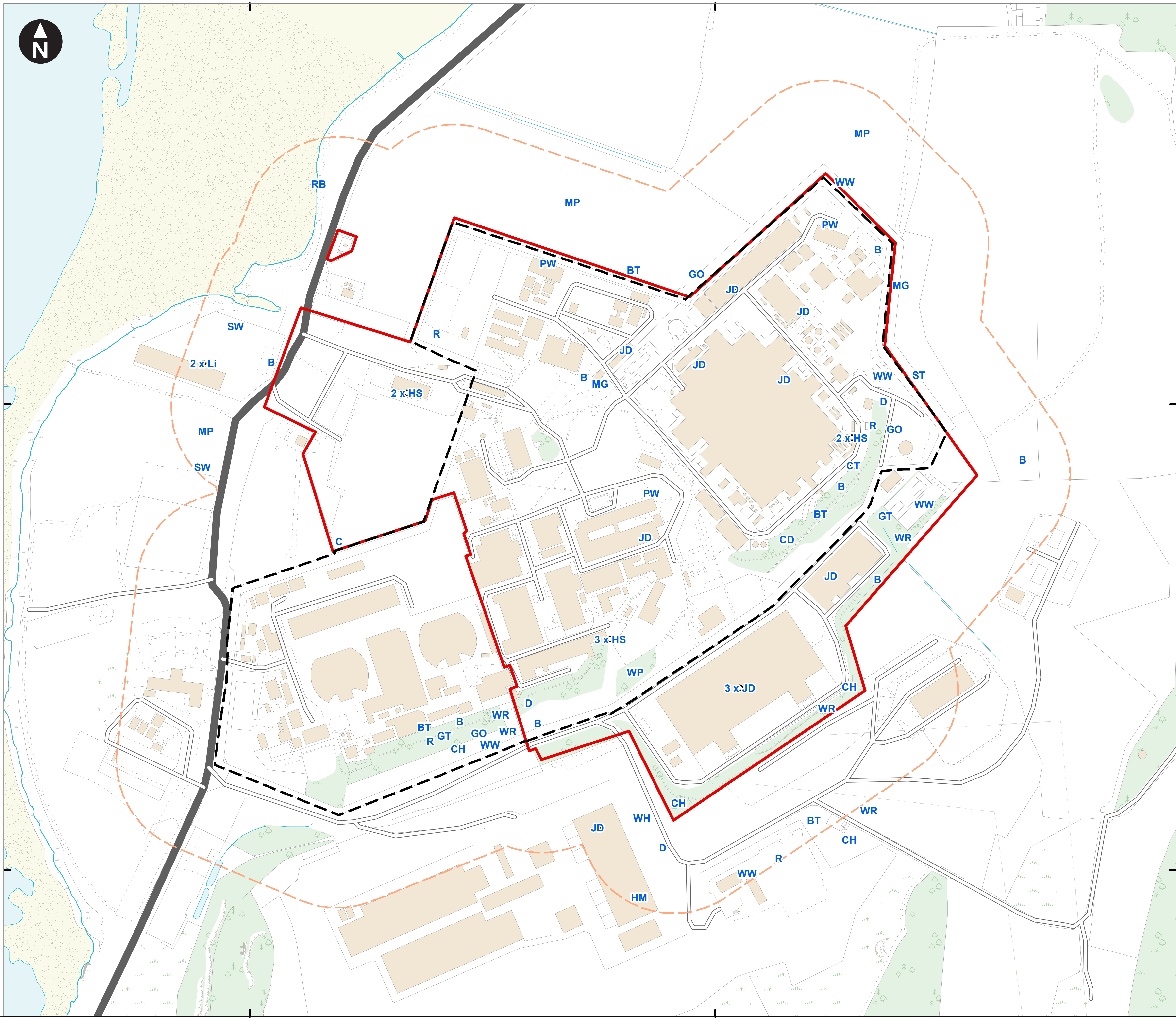

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Key

- Hunterston B Nuclear Site Licence boundary
- Double security fence
- Study Area

B	Blackbird
BT	Blue tit
C	Carrion crow
CH	Chaffinch
CT	Coal tit
CD	Collared dove
D	Dunnock
GO	Goldfinch
GT	Great tit
HM	House martin
HS	House sparrow
JD	Jackdaw
LI	Linnet
MG	Magpie
MP	Meadow pipit
PW	Pied Wagtail
RB	Reed bunting
R	Robin
SW	Sedge warbler
ST	Song thrush
WH	Whitethroat
WW	Willow warbler
WP	Woodpigeon
WR	Wren

0 50 100 150 200 m

Scale at A3: 1:4,000

Hunterston B Decommisioning EIA
Baseline Report: Breeding and Non-breeding Birds

Figure 3.3a
Breeding bird territories (terrestrial species)

September 2020

wood.

218000

218500

651500

651000

N

OC

HG

LB

Key

Hunterston B Nuclear Site Licence boundary

Double security fence

Study Area

HG Herring gull

LB Lesser black-backed gull

OC Oystercatcher

0 50 100 150 200 m

Scale at A3: 1:4,000

Hunterston B Decommisioning EIA
Baseline Report: Breeding and Non-breeding Birds

Figure 3.3b
Breeding bird territories (seabird species)

September 2020

wood.

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Appendix B Species names and BTO codes

BTO species code	Species (Common) name	Species (Scientific name)
AE	Arctic term	*Sterna paradisaea*
BO	Barn owl	*Tyto alba*
BA	Bar-tailed godwit	*Limosa lapponica*
BE	Bean goose	*Answer fabalis*
TY	Black guillemot	*Cepphus grylle*
B.	Blackbird	*Turdus merula*
BC	Blackcap	*Sylvia atricapilla*
BH	Black-headed gull	*Chroicocephalus ridibundus*
BW	Black-tailed godwit	*Limosa limosa*
BV	Black-throated diver	*Gavia arctica*
BT	Blue tit	*Cyanistes caeruleus*
BF	Bullfinch	*Pyrrhula pyrrhula*
BZ	Buzzard	*Buteo buteo*
LQ x BY	Cackling x barnacle goose hybrid	*Branta hutchinsii x leucopsis*
CG	Canada goose	*Branta canadensis*
C.	Carrion crow	*Corvus corone*
CH	Chaffinch	*Fringilla coelebs*
CC	Chiffchaff	*Phylloscopus collybita*
CT	Coal tit	*Periparus ater*
CD	Collared dove	*Streptopelia decaocto*
CR	Common crossbill	*Loxia curvirostra*
GU	Common guillemot	*Uria aalge*
CM	Common gull	*Larus canus*
CS	Common sandpiper	*Actitis hypoleucos*
CN	Common tern	*Sterna hirundo*
CA	Cormorant	*Phalacrocorax carbo*
CO	Coot	*Fullica atra*
CU	Curlew	*Numenius arquata*

BTO species code	Species (Common) name	Species (Scientific name)
DN	Dunlin	*Calidris alpina*
E.	Eider	*Somateria mollissima*
FP	Feral pigeon	*Columba livia (domest.)*
FF	Fieldfare	*Turdus pilaris*
F.	Fulmar	*Fulmarus glacialis*
GA	Gadwall	*Anas strepera*
GC	Goldcrest	*Regulus*
GP	Golden plover	*Pluvialis apricaria*
GN	Goldeneye	*Bucephala clangula*
GO	Goldfinch	*Carduelis carduelis*
GD	Goosander	*Mergus merganser*
GH	Grasshopper warbler	*Locustella naevia*
GB	Great black-backed gull	*Larus marinus*
GS	Great spotted woodpecker	*Dendrocopos major*
GT	Great tit	*Parus major*
GR	Greenfinch	*Chloris*
GK	Greenshank	*Tringa nebularia*
H.	Grey heron	*Ardea cinerea*
P.	Grey partridge	*Perdix perdix*
GL	Grey wagtail	*Motacilla cinerea*
GJ	Greylag goose	*Anser anser*
HH	Hen harrier	*Circus cyaneus*
HG	Herring gull	*Larus argentatus*
HC	Hooded crow	*Corvus cornix*
HM	House martin	*Delichon urbicum*
HS	House sparrow	*Passer domesticus*
JD	Jackdaw	*Coloeus monedula*
JS	Jack snipe	*Lymnocryptes minimus*
J.	Jay	*Garrulus glandarius*
K.	Kestrel	*Falco tinnunculus*

BTO species code	Species (Common) name	Species (Scientific name)
KF	Kingfisher	*Alcedo atthis*
KI	Kittiwake	*Rissa tridactyla*
KN	Knot	*Calidris canutus*
L.	Lapwing	*Vanellus vanellus*
LB	Lesser black-backed gull	*Larus fuscus*
LR	Lesser redpoll	*Acanthis cabaret*
LI	Linnet	*Linaria cannabina*
ET	Little egret	*Egretta garzetta*
LT	Long-tailed tit	*Aegithalos caudatus*
MG	Magpie	*Pica*
MA	Mallard	*Anas platyrhynchos*
MP	Meadow pipit	*Anthus pratensis*
ML	Merlin	*Falco columbarius*
M.	Mistle thrush	*Turdus viscivorus*
MS	Mute swan	*Cygnus olor*
OC	Oystercatcher	*Haematopus ostralegus*
PE	Peregrine	*Falco peregrinus*
PH	Pheasant	*Phasianus colchicus*
PF	Pied flycatcher	*Ficedula hypoleuca*
PT	Pintail	*Anas acuta*
PW	Pied wagtail	*Motacilla alba*
PO	Pochard	*Aythya ferina*
PU	Puffin	*Fratercula arctica*
PS	Purple sandpiper	*Calidris maritima*
RN	Raven	*Corvus corax*
RM	Red-breasted merganser	*Mergus serrator*
RK	Redshank	*Tringa totanus*
RH	Red-throated diver	*Gavia stellata*
RE	Redwing	*Turdus iliacus*
RB	Reed bunting	*Emberiza schoeniclus*

BTO species code	Species (Common) name	Species (Scientific name)
RP	Ringed plover	*Charadrius hiaticula*
R.	Robin	*Erithacus rubecula*
RC	Rock pipit	*Anthus petrosus*
RO	Rook	*Corvus frugilegus*
TE	Sandwich tern	*Thalasseus sandvicensis*
SP	Scaup	*Aythya marila*
SW	Sedge warbler	*Acrocephalus schoenobaenus*
SA	Shag	*Phalacrocorax aristotelis*
SU	Shelduck	*Tadorna*
SV	Shoveler	*Anas clypeata*
SK	Siskin	*Spinus spinus*
S.	Skylark	*Alauda arvensis*
SN	Snipe	*Gallinago gallinago*
ST	Song thrush	*Turdus philomelos*
SH	Sparrowhawk	*Accipter nisus*
SF	Spotted flycatcher	*Muscicapa striata*
SG	Starling	*Sturnus vulgaris*
SD	Stock dove	*Columba oenas*
SC	Stonechat	*Saxicola rubicola*
SL	Swallow	*Hirundo rustica*
SI	Swift	*Apus*
T.	Teal	*Anas crecca*
TC	Treecreeper	*Certhia familiaris*
TT	Turnstone	*Arenaria interpres*
TW	Twite	*Linaria flavirostris*
WI	Water pipit	*Anthus spinoletta*
W.	Wheatear	*Oenanthe*
WM	Whimbrel	*Numenius phaeopus*
WC	Whinchat	*Saxicola rubetra*
WH	Whitethroat	*Sylvia communis*

BTO species code	Species (Common) name	Species (Scientific name)
WS	Whooper swan	*Cygnus cygnus*
WG	Wigeon	*Anas penelope*
WW	Willow warbler	*Phylloscopus trochilus*
WO	Wood warbler	*Phylloscopus sibilatrix*
WK	Woodcock	*Scolopax rusticola*
WP	Woodpigeon	*Columba palumbus*
WR	Wren	*Troglodytes*
YW	Yellow wagtail	*Motacilla flava*
Y.	Yellowhammer	*Emberiza citrinella*

Appendix C Relevant legislation and policy

Wildlife and Countryside Act 1981 (as amended in Scotland)

For any wild bird species, it is an offence to intentionally or recklessly:

- Kill, injure or take a bird;
- Take, damage, destroy or interfere with a nest of any bird while it is in use or being built;
- Obstruct or prevent any bird from using its nest; and
- Take or destroy an egg of any bird.

For any wild bird species listed on Schedule 1, it's an offence to disturb:

- Any bird while it is building a nest;
- Any bird while is in, on, or near a nest containing eggs or young;
- Any bird while lekking; and
- The dependent young of any bird.

For any wild bird species listed on Schedule 1A, it's an offence to intentionally or recklessly harass any bird.

For any wild bird species listed on Schedule A1, it's an offence to intentionally or recklessly take, damage, destroy or interfere at any time with a nest habitually used by any bird.

Biodiversity Policy

The UK Biodiversity Action Plan (UK BAP), produced in 1994 by the UK Government, was a national strategy for the conservation of biodiversity. The plan was updated in July 2012 to comprise a framework, which is implemented individually by each of the four UK countries and covers the period 2011-2020. Within Scotland, the UK BAP is coordinated through the Biodiversity Action Reporting System (BARS), which is an online tool that contains a list of Scottish priority habitats and species (The Scottish Biodiversity List [SBL]).

The SBL is a list of flora, fauna and habitats considered by the Scottish Ministers to be of principal importance for biodiversity conservation and its publication was a requirement of Section 2(4) of The *Nature Conservation (Scotland) Act 2004*.

https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy/scottish-biodiversity-list

Directive 2009/147/EC (The Wild Birds Directive), 2009

Certain bird species receive protection at a European level as listed on Annex I of the Directive 2009/147/EC of The European Parliament and of The Council of 30 November 2009 on the conservation of wild birds (codified version).

The *Wild Birds Directive* recognises that habitat loss and degradation are the most serious threats to the conservation of wild birds. It therefore places great emphasis on the protection of habitats for endangered as well as migratory species (listed in Annex I), especially through the establishment of a coherent network of Special Protection Areas (SPAs) comprising all the most suitable territories for these species. Together with Special Areas of Conservation (SACs) designated under *Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ('Habitats Directive')*, SPAs form a network of pan-European protected areas known as Natura 2000.

Ramsar Sites

Ramsar sites are wetlands of international importance designated under the Ramsar Convention. Sites proposed for selection are advised by the UK statutory nature conservation agencies, or the relevant administration in the case of Overseas Territories and Crown Dependencies, co-ordinated through JNCC. In selecting sites, the relevant authorities are guided by the Criteria set out in the Convention. The Criteria pertaining specifically to birds are as follows:

- Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds; and
- Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

In the UK, the first Ramsar sites were designated in 1976 since which, many more have been designated. The initial emphasis was on selecting sites of importance to waterbirds within the UK, and consequently many Ramsar sites are also Special Protection Areas (SPAs) classified under the Birds Directive. However, greater attention is now being directed towards non-bird features which are increasingly being taken into account, both in the selection of new sites and when reviewing existing sites.

Birds of Conservation Concern: Red and Amber Lists

Red and Amber list bird are those listed as being of high or medium conservation concern (respectively) in Birds of Conservation Concern (BoCC) 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man (Eaton *et al.*, 2015). Red list species are those that are Globally Threatened according to IUCN criteria; and/or those whose population or range has declined rapidly in recent years; and/or those that have declined historically and not shown a substantial recent recovery.

Appendix D Habitat/crop type codes

Table D.1 Habitat/crop type codes

Code	Habitat/ crop type
BA	Spring barley
BE	**Beach (shingle/ shell / sandy beaches)**
BN	Beans (winter beans, peas, broad beans etc)
BR	Brassicas Other (cabbage, brocoli, kale etc – not oilseed rape)
CA	Carrots / parsnips
CW	Coniferous woodland
DI	Ditch (water-filled)
DR	Ditch Reed (water-filled, and lined/ filled with reeds)
DW	**Deciduous woodland**
FA	Fallow / uncultivated / seta-side
GA	Gardens (residential gardens / housing)
GM	Grazing marsh
HR	**Hedgerows**
HS	Hard standing / bare ground
LE	Legumes Other (Alfalfa/ Lucerne, clover etc)
IG	**Improved grassland / pasture (record livestock if present)**
LA	Lakes (still waterbody: lake, gravel pit, reservoir etc)
MA	Maize
MF	**Mudflats (tidal)**
MS	Maize stubble
MW	**Mixed deciduous/coniferous woodland**
PL	Ploughed land / bare (soil) ground
PO	Pond
RA	Oilseed rape
RB	Reedbed / reed swamp
RO	**Rocky beach**
RI	River / streams

Code	Habitat/ crop type
RS	Rape stubble
SB	Sugar beet
SC	**Scrub**
SI	**Semi-improved grassland**
SM	Saltmarsh
SR	Cereal stubble / rape mix (early in autumn)
ST	Cereal stubble
SW	Sea-wall
UG	**Unimproved grassland**
UR	Urban / buildings
UT	Utility grassland (playing field / park)
WC	Winter-sown cereal (wheat or barley)

Appendix E Desk study data

Table E.1 Breeding bird surveys (EDF 2011-17)

Species name	2017	2015	2011
Blackbird	18	14	6
Blackcap	1	2	3
Blue tit	10	13	3
Buzzard	1	1	1
Carrion crow	3	3	5
Chaffinch	14	15	8
Chiffchaff	0	0	3
Coal tit	5	2	3
Common gull	0	1	0
Dunnock	6	9	0
Eider	0	0	0
Goldcrest	3	1	0
Goldfinch	8	7	2
Grasshopper warbler	0	0	1
Great spotted woodpecker	0	1	0
Great tit	7	7	4
Greenfinch	0	1	0
House martin	0	0	5
Jackdaw	2	1+	8
Linnet	2	3	2
Long tailed tit	2	0	0
Magpie	2	2	1
Mallard	2	1	10
Meadow pipit	7	4	0
Mistle thrush	2	2	3
Mute swan	0	0	1
Oystercatcher	4	3	0

Species name	2017	2015	2011
Pied flycatcher	0	0	1
Pied wagtail	7	4	0
Reed bunting	4	3	0
Robin	13	13	4
Sedge warbler	8	6	4
Song thrush	5	3	0
Spotted flycatcher	1	1	0
Starling	3	3	5
Stonechat	1	1	0
Swallow	3	0	5
Treecreeper	0	1	0
Whitethroat	3	4	5
Willow warbler	13	9	3
Wood pigeon	3	4	0
Wren	19	20	4

NB: the figures shown are the maximum number of breeding territories/ pairs within the survey area, including confirmed, probable and possible breeding territories/ pairs.

Table E.2 Non-breeding bird surveys (EDF 2018-19): peak species counts by month

Species / Month / Peak counts	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Feb 2019	Mar 2019
Greylag goose	0	36	0	4	0	34
Teal	1	16	5	0	9	10
Shelduck	n/c	26	30	48	63	23
Mallard	0	54	15	27	73	13
Pintail	0	0	0	0	1	0
Eider	n/c	0	0	14	6	4
Goldeneye	0	0	0	0	1	0
Red-breasted merganser	4	9	5	3	1	0
Red-throated diver	n/c	0	0	1	0	0
Cormorant	2	0	5	0	5	2
Shag	11	0	23	28	7	4

Species / Month / Peak counts	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Feb 2019	Mar 2019
Grey heron	1	2	1	1	1	0
Little egret	0	3	0	0	0	0
Sparrowhawk	0	0	1	0	1	0
Buzzard	3	4	2	3	4	3
Kestrel	0	0	0	0	0	1
Peregrine	0	1	0	0	0	0
Pheasant	n/c	n/c	n/c	n/c	n/c	n/c
Oystercatcher	n/c	114	62	83	128	89
Ringed Plover	n/c	27	43	22	0	1
Lapwing	n/c	0	0	1	1	0
Dunlin	n/c	22	14	1	0	0
Common snipe	11	4	7	4	7	7
Jack snipe	1	0	0	1	1	0
Woodcock	0	0	1	1	1	1
Curlew	72	166	9	51	79	32
Redshank	n/c	33	16	20	6	2
Greenshank	0	1	0	0	0	0
Turnstone	n/c	0	0	15	0	22
Black-headed gull	n/c	60	17	26	80	8
Common gull	n/c	154	153	665	469	95
Lesser black-backed gull	n/c	0	0	0	1	11
Herring gull	19	10	27	5	17	53
Greater black-backed gull	1	1	6	4	3	3
Black guillemot	7	0	0	0	0	0
Woodpigeon	0	5	5	27	20	33
Feral pigeon	n/c	n/c	n/c	n/c	n/c	n/c
Great spotted woodpecker	4	4	11	9	8	14
Magpie	4	4	11	9	8	14
Jackdaw	230	37	169	24	250	115

Species / Month / Peak counts	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Feb 2019	Mar 2019
Rook	25	10	0	0	6	2
Carrion crow	n/c	7	52	33	35	16
Raven	1	1	2	2	0	0
Goldcrest	2	5	3	2	6	8
Blue tit	11	5	89	8	31	28
Great tit	7	1	5	3	7	8
Coal tit	9	3	4	4	1	4
Long-tailed tit	5	0	2	0	3	6
Treecreeper	0	1	0	2	1	3
Wren	15	23	31	12	15	16
Starling	107	0	20	120	39	0
Blackbird	5	23	27	20	16	12
Fieldfare	85	2	5	22	0	0
Song thrush	7	12	25	12	7	8
Redwing	1	34	27	181	69	0
Mistle thrush	5	3	11	0	3	5
Robin	20	19	27	22	14	22
Stonechat	0	1	0	0	0	0
Dunnock	8	17	31	14	11	13
Pied wagtail	19	9	4	2	5	7
Grey wagtail	2	2	1	1	0	2
Meadow pipit	19	9	4	13	5	7
Water pipit	0	1	0	0	0	0
Rock pipit	5	40	12	11	14	15
House sparrow	0	0	4	3	1	4
Chaffinch	5	12	322	355	63	21
Brambling	0	0	0	1	0	0
Greenfinch	0	19	51	19	29	7
Goldfinch	9	5	2	2	2	1

Species / Month / Peak counts	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Feb 2019	Mar 2019
Linnet	0	0	25	0	0	1
Lesser redpoll	0	0	0	1	0	0
Siskin	1	43	1	18	3	3
Bullfinch	0	3	0	0	0	0
Reed bunting	0	2	3	2	1	5

n/c – not counted

Table E.3 JNCC Seabird Monitoring Programme: breeding seabird colonies within 10 km of the Site

Seabird colony site	Distance (direction) from the Site	Species	1998-2002	2014	2016	2017	2019
Hunterston Cliffs	180 m (S)	Fulmar	33				
Hunterston (Tysties) 2	600 m (SW)	Black guillemot	10				
Hunterston (Tysties) 3	2.0 km (SSW)	Black guillemot	0				
Hunterston (Tysties) 1	2.3 km (NNE)	Black guillemot	10				
Little Cumbrae Island	2.6 km (W)	Black guillemot	6				
Little Cumbrae Island	2.6 km (W)	Common gull	16				
Little Cumbrae Island	2.6 km (W)	Fulmar	12				
Keppel	2.6 km (NNW)	Fulmar	16				11
Little Cumbrae Island	2.6 km (W)	Great black-backed gull	120				
Little Cumbrae Island	2.6 km (W)	Herring gull	2,000				
Little Cumbrae Island	2.6 km (W)	Lesser black-backed gull	1,200				
Little Cumbrae Island	2.6 km (W)	Shag	20				
Hunterston, Clydeport	3.1 km (NE)	Black-headed gull	50				
Hunterston, Clydeport	3.1 km (NE)	Common gull	4				
Hunterston, Clydeport	3.1 km (NE)	Common tern	12				
Hunterston, Clydeport	3.1 km (NE)	Great black-backed gull	1				
Doughend Hole	4.5 km (NW)	Fulmar	10				11
Barbay Hill	5.3 km (NNW)	Common gull	144				11
Kerrysonlia Point	7.9 km (NW)	Fulmar	3				

Seabird colony site	Distance (direction) from the Site	Species	1998-2002	2014	2016	2017	2019
Horse Island	8.7 km (SSE)	Cormorant	51	0	2	0	
Horse Island	8.7 km (SSE)	Great black-backed gull	0	20	6	2	
Horse Island	8.7 km (SSE)	Herring gull	0	1,693	1,113	1,245	
Horse Island	8.7 km (SSE)	Lesser black-backed gull	0	1,093	910	901	
Horse Island	8.7 km (SSE)	Shag	0	1	3	0	
Largizean Farm	9.7 km (WNW)	Fulmar	4				0
Ardrossan Harbour	10 km (SSE)	Black guillemot	20				
Ardrossan Harbour	10 km (SSE)	Lesser black-backed gull	2,677				
Dunstrone	10.5 km (WNW)	Fulmar	2				

Zero ('0') denotes that a count was undertaken but no birds were located in that year; blank denotes that no count was undertaken.

Table E.4 Summary (number of records) of SWSEIC bird data

		Breeding season[16]		Non-breeding season	
Species name	**Conservation status[17]**	**Potentially within 1km of Site[18]**	**Potentially within Site**	**Potentially within 1km of Site**	**Potentially within Site**
Arctic Tern	Annex I, SB	(1)			
Barn Owl	WCA(Sch1), SB			2	
Barnacle goose	Annex I, SB			1	
Bar-tailed godwit	Annex I, SB	(4)	(2)	4	2
Black-headed gull	SB	5	2	7	3
Black-throated diver	WCA(Sch1), Annex I, SB			1	
Bullfinch	SB	2	1	2	
Common crossbill	WCA(Sch1)				2
Common tern	Annex I, SB	(3)	(1)		
Curlew	SB, BoCC (red)	3	2	9	4
Dunlin	Annex I, SB	(4)	(1)	3	

[16] Figures in parenthesis relate to species recorded during the breeding season that are unlikely to breed in the local area, and thus, likely relate to passage birds and/or foraging seabirds from nesting colonies in the area.

[17] WCA(Sch1) = listed on schedules 1, 1A or A1 of the Wildlife & Countryside Act 1981 (as amended in Scotland); Annex I = Annex I of the Birds Directive; SB = Scottish Biodiversity List; BoCC (red) = BoCC red list in Eaton *et al*., 2015).

[18] Potentially within 1km of the Site but outwith the Site boundary

Species name	Conservation status[17]	Breeding season[16]		Non-breeding season	
		Potentially within 1km of Site[18]	Potentially within Site	Potentially within 1km of Site	Potentially within Site
Dunnock	SB	3	1	2	1
Golden plover	Annex I, SB			2	1
Goldeneye	WCA(Sch1)			2	
Grasshopper warbler	SB, BoCC (red)	5	3		
Greenshank	WCA(Sch1)			2	1
Grey Partridge	SB, BoCC (red)	1			
Grey Wagtail	BoCC (red)	1		1	1
Yellow wagtail	SB, BoCC (red)		(1)		
Herring gull	SB, BoCC (red)	7	2	7	4
Hooded crow	SB	4	1	3	2
House sparrow	SB, BoCC (red)	2	1	1	
Kestrel	SB		3	1	2
Kingfisher	WCA(Sch1), Annex I, SB			1	1
Kittiwake	BoCC (red)	(1)		1	1
Lapwing	SB, BoCC (red)	5	1	2	1
Lesser redpoll	SB, BoCC (red)	2	2	1	1
Linnet	SB, BoCC (red)	5			
Merlin	WCA(Sch1), Annex I, SB, BoCC (red)				1
Mistle thrush	BoCC (red)	5	2	2	1
Pied flycatcher	BoCC (red)	1			
Puffin	BoCC (red)	(1)			
Red-throated diver	WCA(Sch1), Annex I, SB			2	1
Reed bunting	SB	6	3	2	2
Ringed plover	BoCC (red)	7	1	2	
Sandwich tern	Annex I, SB	(3)	(2)		
Shag	BoCC (red)	5		5	1
Siskin	SB	2	1		1

Species name	Conservation status[17]	Breeding season[16]		Non-breeding season	
		Potentially within 1km of Site[18]	Potentially within Site	Potentially within 1km of Site	Potentially within Site
Skylark	SB, BoCC (red)			2	1
Song thrush	SB, BoCC (red)	3	3	4	3
Spotted flycatcher	SB, BoCC (red)	4	3		1
Starling	SB, BoCC (red)	7	2	4	3
Swift	SB	2	1		
Twite	SB, BoCC (red)	2	2	2	
Whinchat	BoCC (red)		1		
Wood warbler	SB, BoCC (red)	3	1		
Woodcock	SB, BoCC (red)			2	1
Yellowhammer	SB, BoCC (red)			1	

Table E.5 BTO WeBS data: 5-year mean peak counts by count sector (**Figure 3.2**) within 5km

Species ↓ / Sector *→	72432 Hunterston Sands [1]	72431 Ardrossan – West Kilbride [2]	72082 Hunterston Lagoon [3]	72434 Hunterston – Fairlie [4]	72452-57, Great Cumbrae Island [5]	72450-51 Wemyss Bay – Fairlie [6]
Canada Goose	1				2	
Greylag Goose	32				5	
Greylag Goose (British/Irish)					5	
Greylag Goose (Icelandic)	32					
Taiga/Tundra Bean Goose	1					
Pink-footed Goose	9					
Mute Swan	19	3	76	12	1	7
Whooper Swan	6		8			
Shelduck	124	5	1	4		1
Shoveler	2					
Gadwall	8		2			
Wigeon	398	71	290	206	23	55
Mallard	106	58	42	21	23	35

Species ↓ / Sector *→	72432 Hunterston Sands [1]	72431 Ardrossan – West Kilbride [2]	72082 Hunterston Lagoon [3]	72434 Hunterston – Fairlie [4]	72452-57, Great Cumbrae Island [5]	72450-51 Wemyss Bay – Fairlie [6]
Pintail	2		1			
Teal	108	17		7	18	
Pochard				1		
Scaup			2			
Eider	146	92	2	46	11	280
Eider (except Shetland)	146	92	2	46	11	280
Goldeneye	11	1	13	2		9
Goosander						2
Red-breasted Merganser	41	5	12		3	30
Red-throated Diver	4	1				2
Black-throated diver	1					
Little Grebe			15	2	1	1
Grey Heron	7	4	27	4	4	4
Shag	54	29		15	11	24
Cormorant	22	37	1	4	26	36
Moorhen	3					
Coot	1					
Oystercatcher	519	246	259	109	113	244
Lapwing	53	4	102	4	33	19
Golden Plover	1	2				
Grey Plover	3	1				
Ringed Plover	45	16			3	42
Whimbrel	6					
Curlew	421	81	31	3	41	83
Bar-tailed Godwit	31	2	10	1		
Black-tailed godwit	3					
Turnstone	22	17	1		13	15
Knot	12					
Dunlin	56	30	54	4		13

Species ↓ / Sector *→	72432 Hunterston Sands [1]	72431 Ardrossan – West Kilbride [2]	72082 Hunterston Lagoon [3]	72434 Hunterston – Fairlie [4]	72452-57, Great Cumbrae Island [5]	72450-51 Wemyss Bay – Fairlie [6]
Purple Sandpiper		4				
Snipe	6	1				
Common Sandpiper	1				5	
Redshank	63	42	108	77	16	11
Greenshank	2	1	10	4		
Unidentified small wader					1	
Kittiwake	2					
Black-headed Gull	220		n/c	67	1	n/c
Common Gull	640		n/c	40	3	n/c
Great Black-backed Gull			n/c	1	1	n/c
Herring Gull	25		n/c	35	28	n/c
Lesser Black-backed Gull	1		n/c	4	3	n/c
Sandwich Tern	13	10	n/c	25		n/c
Common Tern	1		n/c	2		n/c
Common/Arctic Tern	1		n/c			n/c

* No data for Sector 72146 (Glenburn reservoir); [1] – 07/08-11/12 data; [2]- 15/16-17/18 data (3 years only); [3]– 2005/6 -2009/10 data; [4] – 2013/14 – 2017/18 data; [5] – 2016/17 – 2017/18 data (2 years only); [6] – 2008/9 – 2012/13 data; n/c – not counted

Appendix F Survey parameters

Table F.1 Breeding bird survey

Survey visit No.	Date	Start – finish	Weather conditions
1	26/04/2019	06:10 – 09:25	Precipitation (drizzle); Wind (Beaufort 2-3, SE); Cloud (8/8 Oktas); Visibility (very good > 3 km); Temperature (8-10 °C)
2	09/05/2019	05:10 – 09:00	Precipitation (none); Wind (Beaufort 1-2, NW); Cloud (1/8 Oktas); Visibility (very good > 3 km); Temperature (9-13 °C)
3	24/05/2019	05:10 – 09:00	Precipitation (none); Wind (Beaufort 1-2, SW); Cloud (2-6/8 Oktas); Visibility (very good > 3km); Temperature (8-12 °C)
4	04/06/2019	05:00 - 12:15	Precipitation (none); Wind (Beaufort 1-2, S); Cloud (2-7/8 Oktas); Visibility (very good > 3km); Temperature (11-12 °C)
5	27/06/2019	06:45 – 08:45	Precipitation (occasional drizzle); Wind (Beaufort 2, NW); Cloud (8/8 Oktas); Visibility (1-2 km); Temperature (14-15 °C)
6	12/07/2019	06:00 – 08:15	Precipitation (none); Wind (Beaufort 2-3, SE); Cloud (4-8/8 Oktas); Visibility (very good > 3km); Temperature (16-18 °C)

Table F.2 Non-breeding bird survey

Survey visit No.	Date	Start – finish	Time of High (H) or Low (L) tide	Weather conditions
1	09/10/2019	08:00-13:00	10:27 H	Light/heavy showers, Wind F3-4 SW, Cloud Cover 6-8/8, Visibility 1-3km Temp, 10-12c
2	24/10/2019	11:00-16:00	15:21 L	Light showers. Wind F3-4 SW-NW, Cloud Cover 6-8/8, Visibility >3km Temp, 10-11c
3	12/11/2019	09:00-14:00	12:30 H	Dry, Wind F3-4 N-NW, Cloud Cover 4-6/8, Visibility >3km, Temp 6-8c
4	22/11/2019	10:00-15:00	13:55 L	Light showers. Wind F2-4 NE, Cloud Cover 4-8/8, Visibility >3km, Temp 5-6c
5	06/12/2019	09:45-14:45	13:35 L	Heavy rain/light showers, Wind F2-3 W-NW, Cloud Cover -7-8/8, Visibility 1-3km, Temp 8-9c

Survey visit No.	Date	Start – finish	Time of High (H) or Low (L) tide	Weather conditions
6	13/12/2019	09:00-14:00	12:44 H	Dry, Wind F2-3 NW, Cloud Cover 1-2/8, Visibility >3km, Temp 4-6c
7	09/01/2020	09:30-14:30	11:07 H	Light showers, Wind F2-3 N-NE, Cloud Cover 2-7/8, Visibility >3km, Temp 3-6c
8	22/01/2020	11:15-16:15	16:02 L	Dry, Wind F1-2 W, Cloud Cover 7-8/8, Visibility >3km, Temp 8-9c
9	07/02/2020	08:4513:45	10:35 H	Dry, Wind F4 SE, Cloud Cover 2-7/8, Visibility >3km, Temp 4-7c
10	20/02/2020	12:00-17:00	15:48 L	Heavy showers/rain, Wind F5-6 W, Cloud Cover 4-8/8, Visibility >3km, Temp 4-5c
11	09/03/2020	08:30-133:30	11:54 H	Light rain, Wind F3-4 W, Cloud Cover 7-8/8, Visibility >3km, Temp 7-8c
12	18/03/2020	09:15-14:15	13:28 L	Light/heavy showers, Wind F2-4 SW, Cloud Cover 4-8/8, Visibility 1-3km to >3km, Temp 6-8c

Appendix G Breeding bird survey

Table G.1 Breeding birds survey 2019: gulls and jackdaw (total number of potentially breeding pairs)

Species name		30 April	21 May	04 June	19 June	12 July	23 July
Herring gull	Pairs	12	3	8	10	9	12
Herring gull	Singles	5	10	10	5	5	4
Jackdaw	Pairs	2	7	6	9	8	10
Jackdaw	Singles	2	1	5	1	3	3
Lesser black-backed gull	Pairs	6	2	1	2	1	1
Lesser black-backed gull	Singles	0	2	1	5	5	3
Oystercatcher	Pairs	1	2	2	1	2	0
Oystercatcher	Singles	0	4	2	1	4	2

Table G.2 Breeding bird surveys: total number of non-breeding birds recorded on each survey visit

Species name	Annex I	Scottish Biodiversity List	BoCC Red/Amber	30 April	21 May	04 June	19 June	12 July	23 July
Black guillemot			Amber				4	6	5
Blackcap				2					
Black-headed gull		Yes	Amber			1		3	13
Buzzard				1	2	1	1	1	
Canada goose				1					
Common gull			Amber		1		1	2	24
Common sandpiper			Amber					3	
Common tern	Yes	Yes	Amber				2	1	
Cormorant								2	
Curlew		Yes	Red	5				2	
Eider			Amber				1		
Great black-backed gull			Amber		1	2	3	2	2
Grey heron					1	1	1		1
Greylag goose			Amber	3	8	6	2	2	
Herring gull		Yes	Red		4	4	11	4	6
Kestrel		Yes	Amber		1				

Species name	Annex I	Scottish Biodiversity List	BoCC Red/Amber	30 April	21 May	04 June	19 June	12 July	23 July
Lesser black-backed gull			Amber		1	1	2		1
Mallard			Amber		2			3	
Mistle thrush			Red						9
Oystercatcher			Amber	12		3	4	4	3
Pheasant							1		
Redshank			Amber						1
Shag			Red			2	2	1	1
Shelduck	Yes		Amber			2		1	1
Starling		Yes	Red			11	11	14	53
Stock dove			Amber	1	1			1	
Swallow				2	9	3	4	9	6
Wheatear				1		1			

Appendix H Non-breeding bird survey

Table H.1 Non-breeding bird survey results

Species	09/10/19	24/10/19	12/11/19	22/11/19	06/12/19	13/12/19	09/01/20	22/01/20	07/02/20	20/02/20	09/03/20	18/03/20
Bar-tailed godwit	1											
Black guillemot	4	4		2			3	5	6		9	4
Blackbird	x	x	15	x	x	x	x	x	x	x	x	x
Black-headed gull	9	6	8	20	35	12	8	17	8	11	3	6
Blue tit	x	x	x	x	x	x	x	x	x	x	x	x
Bullfinch								x				
Buzzard	1	2	1	1	1	1	1	1	1	1	1	2
Cackling x barnacle goose hybrid										1		
Canada goose								2	13	9	2	4
Carrion crow	x	x	x	x	x	x	x	x	x	x	x	x
Chaffinch	x	x	x	x	x	x	x	x	x	x	x	x
Collared dove							x					
Common guillemot								2				
Common gull	15	150	28	4	34	7	25	34	75	48	26	12
Cormorant	2	21	6	14	3	2	1	3	4	4	2	2
Curlew	35	2	28	45	25	10	42	16	33	28	33	3
Dunlin	6	23	14	4	7			85	22			
Dunnock	x	x	x		x	x	x			x	x	x

Species	09/10/19	24/10/19	12/11/19	22/11/19	06/12/19	13/12/19	09/01/20	22/01/20	07/02/20	20/02/20	09/03/20	18/03/20
Eider	4	2	4	2		2	2	9	13	13	50	80
Feral pigeon	x		x		x	x				x		
Fieldfare		x			x	x	15	20	30	x	x	x
Goldcrest	x	x	x		x							
Golden plover					1							
Goldeneye								1				
Goldfinch	x	x	x	18		x	x	x	x	x	x	x
Great black-backed gull	3	1	2	1	1	1	1	2	1	2	2	1
Great tit	x	x	x	x		x	x	x	x	x	x	
Great-spotted woodpecker						x	x					x
Greenfinch				x	40	x		30	40	30	30	20
Greenshank								1				
Grey heron	2	2	2	1	2	1	1	1	1	1		
Grey wagtail	2						1	1				
Greylag goose	22	23		42		87	65	12	5	37	18	18
Herring gull	11	4	6	14	6	4	13	8	11	18	7	7
House sparrow				x		x		x	x	x	x	
Jackdaw	45		32	x	30	x	x	39	x	x	x	34
Jay						x						
Kestrel	1	1	1	1	1		1	1		1	1	
Knot	90								1			

Species	09/10/19	24/10/19	12/11/19	22/11/19	06/12/19	13/12/19	09/01/20	22/01/20	07/02/20	20/02/20	09/03/20	18/03/20
Lapwing									18		15	
Lesser black-backed gull										1	3	8
Linnet		35		15		x						x
Little egret			1	1	1	1		1	1		1	
Long-tailed tit		x						x			x	
Magpie	x	x	x	x	x	x	x	x	x	x	x	x
Mallard	23	2	22	12		8	20	7	8	22	14	2
Meadow pipit	x	x	x	30	x	x	x	x	x	x	x	x
Mistle thrush		x	x	x	x	x	x	x	x	x	x	x
Mute swan	4		7				2			2		
Oystercatcher	53	2	65	34	80	35	155	104	84	27	37	4
Peregrine			1		2	1					1	
Pheasant	x				1	x			x			x
Pied wagtail	17	12	13	x	x	x	x	x	x	x	x	x
Raven			1			1			1	2	2	1
Red-breasted merganser	17	2	2		4	1	1	6	3	2	2	2
Redshank	14	3	10	7	7	5	9	13	5	4	6	
Red-throated diver								2				
Redwing		x	x	25		x	30		50	40	70	60
Reed bunting			x	x	x		x			x		x
Ringed plover								12	2			

Species	09/10/19	24/10/19	12/11/19	22/11/19	06/12/19	13/12/19	09/01/20	22/01/20	07/02/20	20/02/20	09/03/20	18/03/20
Robin	x	x	x	x	x	x	x	x	x	x	x	x
Rock pipit	x	x	14	x	x	x	x	x	x	x	x	x
Rook	x											
Shag	4	3	17	5	14	8	23	8	15	6	9	5
Shelduck	2	2	26	30	26	29	18	23	21	16	23	9
Skylark												x
Snipe			1	3		4		1	1			
Song thrush	x	x	x	x	x	x	x	x	x	x	x	x
Sparrowhawk			1			1					1	1
Starling	60	48	x	x	x	x	x	22		50	45	x
Stock dove											x	
Stonechat						x		x				
Teal			16	22	17	16	28	1	24	17	25	22
Treecreeper							x				x	
Turnstone			55		8	75	13	4	4		7	
Twite						14						
Whooper swan	2											
Wigeon	165	60	200	90	75	25	45	18	9	25	28	6
Woodpigeon	x	x	x	x	x	x	x	x	x	x	x	x
Wren			x	x		x	x	x	x			x

Blank cells = not present; x = present but numbers below threshold level of 10.

Appendix 8G: Verification of Terrestrial Biodiversity Baseline

November 2023

EDF Nuclear Generation Limited (ENGL)

EDF Nuclear Generation Limited (ENGL)

Decommissioning of Hunterston B Nuclear Power Station

Verification of Terrestrial Biodiversity Baseline

WSP UK Limited – November 2023

Report for

[redacted]

Main contributors

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Document revisions

No.	Details	Date
01	Draft	January 2023
02	Final	November 2023

Contents

1. Introduction

1.1 Overview

1.1.1 EDF Energy Nuclear Generation Limited (the 'Applicant') is applying for consent from the Office for Nuclear Regulation (ONR) to decommission Hunterston B Nuclear Power Station ('HNB'). The decommissioning works (the 'Proposed Works') will include the dismantling and deconstruction of buildings and structures in areas within and outside of the Nuclear Site License ('NSL') boundary that are part of the power station. An Indicative Dismantling Works Area ('Works Area') has been identified to delineate these areas. The land inside the NSL boundary is referred to as the 'Site'. The Site and Works Area boundaries are shown on **Figure 1.1**.

1.1.2 To inform the Ecological Impact Assessment (EcIA) of the Proposed Works, a suite of ecological surveys was carried out by Wood Environment & Infrastructure Solutions UK Ltd ('Wood') in 2019 and 2020 (the 'Baseline Surveys'). This included habitat surveys and surveys of a range of taxa, including otter (*Lutra lutra*), badger (*Meles meles*), bats, and birds. These surveys are summarised in **Section 1.4** and detailed in separate baseline reports:

- Wood (2019a) Hunterston B Decommissioning EIA - Baseline Report: Phase 1 Habitat Survey;
- Wood (2019b) Hunterston B Decommissioning EIA - Baseline Report: Badger;
- Wood (2019c) Hunterston B Decommissioning EIA - Baseline Report: Otter;
- Wood (2020a) Hunterston B Decommissioning EIA - Baseline Report: Bats; and
- Wood (2020b). Hunterston B Decommissioning EIA - Baseline Report: Breeding and Non-breeding Birds.

1.1.3 These surveys and survey reports, combined with a desk-based study of other biodiversity information collected from the Site and surrounding area (Wood 2020[1]), establish the terrestrial biodiversity baseline against which the predicted effects of the Proposed Works on ecological features are to be assessed.

1.1.4 A period of over three years has elapsed since the completion of the Baseline Surveys and the area delineated as the Works Area has been refined, mainly to include marine infrastructure associated with HNB, including a jetty and the access route to it, which extends the Works Area to the south of the Site (**Figure 1.1**). Therefore, a further habitat survey, covering the Site, Works Area and perimeter areas, was undertaken in 2022.

1.1.5 The purpose of the 2022 survey, also referred to as a '*Baseline Verification Survey*', was to determine whether the terrestrial biodiversity baseline, derived by the previous survey work and desk-based study, remains valid to inform the EcIA, recognising that any substantive changes in the extent, distribution or character of habitat types within the Works Area could trigger a requirement for survey updates and/or additional survey work.

[1] WSP (2020). Hunterston B Decommissioning EIA - Baseline Report: Desk Study (Terrestrial Biodiversity).

1.2 The Site and Survey Area

1.2.1 HNB is located on the west coast of Scotland on the Firth of Clyde, opposite the islands of Great and Little Cumbrae. It is approximately 7 km south/south-west of the seaside town of Largs, approximately 3.5 km to the south-west of West Kilbride, and lies within the administrative area of North Ayrshire Council (NAC). The centre of the Site is at approximate National Grid Reference (NGR) NS 184 514. Non-operational areas of the Site continue to be managed for biodiversity conservation in accordance with the HNB Integrated Land Management Plan (ILMP)[2].

1.2.2 The Works Area extends to approximately 30 ha and is predominantly buildings and hard standing (mainly access and car parks), interspersed with areas of amenity grassland. Tree cover is mainly around the southern perimeter of the Site. Hunterston A (HNA) is situated to the west of, and immediately adjacent to, HNB and is also predominantly built infrastructure and hard standing.

1.2.3 The 'Survey Area' includes the Site and Works Area (see **Figure 1.1**) and a 100 m perimeter area, extended to 250 m to record any apparent evidence of the presence of legally protected species and/or species of notable biodiversity conservation importance, for example otter, which was recorded by the Baseline Surveys (Wood 2019c). The Survey Area encompasses all areas previously surveyed in 2019.

1.3 Survey objectives

1.3.1 The survey objectives are summarised below:

- Map the different habitat types within the Survey Area, employing the standard Phase 1 Habitat Survey method[3], including checking and updating the previous Phase 1 Habitat Survey (Wood 2019a).
- The Phase 1 Habitat Survey method is to be 'extended'[4] to include recording any apparent evidence of the presence of legally protected species and/or other species of notable biodiversity conservation importance.
- Complete a brief visual assessment of built structures within the Survey Area, checking, verifying and updating the previous conclusions regarding the suitability of built structures for roosting bats (Wood 2020a).
- Identify any changes in the extent, distribution or character of habitats within the Survey Area that trigger a requirement for additional survey work or updates to the Baseline Surveys.
- Outline the scope of any additional survey work that is required to update the biodiversity baseline prior to completion of the EcIA.

1.4 Terrestrial biodiversity baseline

1.4.1 This report is intended to be read in conjunction with the baseline reports referenced in **Section 1.1**, with the baseline survey reports summarised briefly in **Table 1.1**.

[2] EDF Energy Nuclear Generation Ltd (2017) Hunterston Integrated Land Management Plan.

[3] Joint Nature Conservation Committee (2010). Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit. JNCC, Peterborough.

[4] Institute of Environmental Assessment. (1995). Guidelines for Baseline Ecological Assessment. London, UK: E & FN Spon.

Table 1.1 Summary of terrestrial biodiversity baseline

Baseline report	Summary of biodiversity baseline
Hunterston B Decommissioning EIA - Baseline Report: Phase 1 Habitat Survey (Wood 2019a).	The habitats within the HNB double security fence predominately comprise hard-standing and buildings, amenity grassland and poor semi-improved grassland, with bordering areas of broadleaved woodland plantation, scattered broadleaved trees, and patches of tall ruderal vegetation. These habitats are likely to be of limited biodiversity conservation value. The habitats outside of the security fence, around the Site perimeter, are predominantly improved grassland and poor semi-improved grassland, which are typically of limited conservation value. There is a hedgerow, a habitat type that is of Principal Importance for Biodiversity Conservation, to the north-east of the security fence and the Site.
Hunterston B Decommissioning EIA - Baseline Report: Badger (Wood 2019b).	No evidence of badger activity was recorded. Suitable habitats for badger within the Study Area[5] include improved and semi-improved grassland and smaller areas of other habitat types.
Hunterston B Decommissioning EIA - Baseline Report: Otter (Wood 2019c).	Evidence of otter activity was recorded along the rocky coastline within the north-western part of the Study Area, including spraints, three active holts, two potential holts, and one active couch. Crevices/alcoves in rock armour extending along the coastline to the south-west, also provide potential rest/shelter sites. It is likely that otters use the coastline for foraging, commuting and resting. Otters could also establish natal dens, holts and/or nursery areas within the Study Area.
Hunterston B Decommissioning EIA - Baseline Report: Bats (Wood 2020a)	The land within the HNB double security fence is of low suitability for bats, predominantly comprising hard standing, lacking semi-natural habitats that are favoured by foraging/commuting bats and being prone to disturbance from artificial lighting and noise associated with operational machinery. This is reflected in low levels of bat activity (e.g. foraging/commuting) inside the double security fence. The majority of the built structures are of negligible or low suitability for roosting bats, being of modern construction, lacking obvious potential roost features, with poor connectivity to surrounding semi-natural habitats and prone to disturbance from noise and artificial lighting as well as being used by gulls. The buildings within the double security fence are also likely to be unsuitable as bat hibernacula, particularly buildings that are in use, which are likely to be prone to disturbance and temperature fluctuations and unlikely to provide stable conditions suitable for hibernating bats. The habitats outside the double security fence and around the perimeter of the Site appear to be less prone to light / noise disturbance and include improved grassland, semi-improved grassland, with limited broadleaved woodland, mixed plantation, hedgerow and scattered trees. These are more suitable habitats for bats, which is reflected in higher levels of bat activity in these areas. No bat roosts were recorded and only three species of bat were recorded foraging/commuting: soprano pipistrelle (*Pipistrellus pygmaeus*), common pipistrelle (*Pipistrellus pipistrellus*) and Noctule (*Nyctalus noctula*).

[5] The 2019/20 Study Area comprises the land inside the HNB double security fence and the land inside the Site, plus a perimeter area extending to 100 m, 250 m or 500 m (varying depending on species/survey type).

Baseline report	Summary of biodiversity baseline
Hunterston B Decommissioning EIA - Baseline Report: Breeding and Non-breeding Birds (Wood 2020b).	The breeding bird community primarily comprises low numbers of common and widespread species that are typical of the area and the habitats within the Study Area. Breeding (or potential breeding) pairs/territories of six species, which are either listed on the Scottish Biodiversity List[6] (SBL) or list of Birds of Conservation Concern (BoCC) Red List [7], were recorded within the Study Area: dunnock (*Prunella modularis*), herring gull (*Larus argentatus*), house sparrow (*Passer domesticus*), linnet (*Linaria cannabina*), reed bunting (*Emberiza schoeniclus*) and song thrush (*Turdus philomelos*). Herring gull nest on the roofs of the power station buildings, house sparrow also breed in built areas and the remaining species are associated with scrub and woodland habitats mainly outside of the HNB double security fence. The non-breeding bird assemblages primarily comprise a range of species associated with coastal habitats and over-wintering farmland birds. Species of potentially notable biodiversity conservation importance are summarised as follows: • Seven species listed on Annex I of the Birds Directive[8]: bar-tailed godwit (*Limosa lapponica*), dunlin (*Calidris alpina*), golden plover (*Pluvialis apricaria*), peregrine (*Falco peregrinus*), red-throated diver (*Gavia stellata*), shag (*Phalacrocorax aristotelis*) and whooper swan (*Cygnus cygnus*). • Twenty species on the Scottish Biodiversity List: bar-tailed godwit, black-headed gull (*Chroicocephalus ridibundus*), bullfinch (*Pyrrhula pyrrhula*), dunlin, dunnock, golden plover, herring gull, house sparrow, kestrel (*Falco tinnunculus*), lapwing (*Vanellus vanellus*), linnet, peregrine, red-throated diver, redwing (*Turdus iliacus*), reed bunting, skylark (*Alauda arvensis*), song thrush (*Turdus philomelos*), starling (*Sturnus vulgaris*), twite (*Linaria flavirostris*) and whooper swan; and • Fourteen species on the BoCC Red List[9]: curlew (*Numenius arquata*), dunlin (added in 2021), greenfinch (*Carduelis chloris*), fieldfare (*Turdus pilaris*), herring gull, house sparrow, lapwing, linnet, mistle thrush (*Turdus viscivorus*), ringed plover (*Charadrius hiaticula*), shag, skylark, starling and twite.

[6] https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy-and-cop15/scottish-biodiversity-list

[7] JNCC (2021) Birds of Conservation Concern 5 (online). Available at: https://jncc.gov.uk/news/bocc5/#:~:text=Amongst%20the%20new%20additions%20to,the%20UK%20in%20recent%20decades (Accessed December 2022).

[8] European Council Directive 2009/147/EC on the conservation of wild birds (the Birds Directive). The Birds Directive (online) Available at: https://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm (Accessed January 2023).

[9] Species recorded by the Baseline Survey (Wood 2020b) that have since been moved from the Red List to the Amber List include redwing, song thrush and grey wagtail (*Motacilla cinerea*). Dunlin and greenfinch were added to the Red List in 2021.

2. Methods

2.1 Extended Phase 1 Habitat Survey

2.1.1 A Phase 1 Habitat Survey of the Site and a 100 m perimeter area was undertaken in August and December 2022. The limited/new additions to the Works Area that were not surveyed in 2019, including a 100 m perimeter around these areas, were surveyed in December 2022.

2.1.2 The Phase 1 Habitat Survey was completed in accordance with good practice[3], which involved identifying and mapping distinct habitat types within the Survey Area, applying standard habitat definitions and descriptions. Target Notes were used to record the location and description (e.g. species composition and structure) of habitats of potentially notable importance for biodiversity conservation. The locations of Target Notes were recorded using a handheld GPS device.

2.1.3 The Phase 1 Habitat Survey method was '*extended*'[4] to include recording of other notable ecological features, including any apparent evidence of the presence of legally protected species and/or other taxa that are of notable biodiversity conservation importance, such as those identified in **Table 1.1**. This included widening the Survey Area to include a 250 m perimeter around the Site and Works Area, specifically to record any apparent evidence of these species, also recognising that otter activity was recorded by the Baseline Surveys (Wood 2019c).

2.1.4 The survey results were compared with the results of the previous Phase 1 Habitat Survey (Wood 2019a) to identify any substantive changes in extent, distribution or character of habitats within the Site and Works Area that trigger a requirement for additional survey work, or updates to previous surveys, prior to completing the EcIA.

2.2 Bats - Preliminary Roost Assessment

2.2.1 An assessment of the suitability of built structures for roosting bats was completed by a WSP Ecologist in December 2022, focussing on buildings within the Site. This Preliminary Roost Assessment (PRA) updated the previous PRA (Wood 2020a). Both PRAs were undertaken in accordance with good practice guidance[10].

2.2.2 The built structures were systematically inspected during daylight and any features suitable for bats were noted, such as weatherboarding, hanging tiles, soffit boxes, gaps in brickwork, cracks, crevices, slipped or broken tiles and gaps around ridge tiles and lead flashing. Roof coverings were viewed from the ground using close-focussing binoculars. Any potential bat roost access points and evidence of bat activity were recorded, such as:

- Bat droppings on the ground or stuck to external walls;
- Suitable roost entry and exit points around eaves, soffits, flashing, under tiles or gaps in mortar;
- Live bats, bat corpses or skeletons; and
- Oily marks (from fur) or localised clean spots around possible access points and roost areas.

[10] Collins (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). he Bat Conservation Trust, London.

2.2.3 In accordance with good practice the buildings are categorised according to their suitability for roosting bats (see **Table 2.1**[10]). Buildings that are potentially suitable hibernation roosts were also identified.

Table 2.1 Guidelines on assessing suitability of buildings for roosting bats

Suitability	Description
Negligible	Negligible habitat features on site likely to be used by roosting bats
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions[11] and/ or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation[12])
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

2.3 Limitations

2.3.1 The Phase 1 Habitat Survey of the Site and a 100 m perimeter area was undertaken in August 2022, updating and verifying the previous habitat survey (Wood 2019a). The part of the Survey Area that extends to the south-west of the Site, adjacent to and including the access track to the jetty, was surveyed on 1 December 2022 and was not surveyed previously in 2019. December is outside of the optimum Phase 1 Habitat Survey period (April to September inclusive), mainly because most plant species tend to be less visible/prominent in winter and are therefore more readily overlooked. However, this part of the Survey Area predominantly comprises habitats that are relatively common and widespread, including areas of poor semi-improved grassland and hard standing, which are unlikely to support rare or notable botanical species, and the survey was undertaken by an experienced ecologist. This sub-optimal timing is therefore unlikely to have had a substantive influence on the baseline habitat mapping.

[11] For example, in terms of temperature, humidity, height above ground level or levels of disturbance.

[12] Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten et al., 2015 in Collins 2016). This phenomenon requires some research in the UK but ecologists should be aware of the potential for a larger number of this species to be present during the autumn and winter in large buildings in highly urbanised environments.

3. Results

3.1 Extended Phase 1 Habitat Survey

3.1.1 The results of the extended Phase 1 habitat survey are shown in **Figure 3.1**. Recorded evidence of otter activity is mapped separately on **Figure 3.2** and described in the accompanying Target Notes (see **Appendix B**).

3.1.2 The habitats within the Site predominantly comprise hard standing and buildings, amenity grassland and poor-semi-improved grassland, with bordering areas of broadleaved woodland planation, scattered broadleaved trees, and patches of tall ruderal vegetation. These habitats are likely to be of limited biodiversity conservation importance.

3.1.3 The habitats around the perimeter of the Site predominately comprise improved grassland and poor semi-improved grassland. These habitats are also typically of limited biodiversity conservation importance. There is a hedgerow, a habitat type that is of Principal Importance for the conservation of biodiversity, to the north-east of the Site.

3.1.4 The distribution, extent and character of habitats within the Site and perimeter areas is similar to that recorded by the previous Phase 1 Habitat survey (Wood 2019a). Only a small number of limited changes to these habitats are apparent and are briefly summarised below.

3.1.5 Gorse scrub is encroaching into poor semi-improved grassland adjacent to, and outside of, the south-east boundary of the Site, to the south and east of the 400kv Switch House. Further to the south-east, along the northern edge of Goldenberry Road, there is a planted hedgerow (mapped as a defunct hedgerow because it is not stock proof[3]) comprising young hawthorn (*Crataegus monogyna*) and holly (*Ilex aquifolium*). In the same area, mainly to the north of Goldenberry Road, habitats previously mapped as ephemeral short perennial vegetation are now categorised as improved grassland (see **Figure 3.1**). These minor changes are outside and to the south-east of the Site and Works Area.

3.1.6 The Survey Area extends to the south of the Site, resulting from iteration of the Works Area boundary. The additional habitats within this area are mainly extensions to habitats previously recorded within other parts of the Survey Area:

- **Broadleaved semi-natural woodland:** a tract of woodland within the south of the Survey Area, east of Power Station Road towards the jetty and outside of the Site and Works Area. The woodland mainly comprises mature sessile oak (*Quercus petraea*), silver birch (*Betula pendula*), sycamore (*Acer pseudoplatanus*) and ash (*Fraxinus excelsior*), with bramble (*Rubus fruticosus*) in the understorey.
- **Marshy grassland:** the largest expanse of this habitat type within the Survey Area is also east of Power Station Road , outside of the Site and Works Area. Common reed (*Phragmites australis*) and reed canary-grass (*Phalaris arundinacea*) are locally dominant and other recorded species include meadow sweet (*Filipendula ulmaria*), marsh bedstraw (*Galium palustre*) and Deschampsia sp.
- **Poor semi-improved grassland:** covers several areas to the south and west of the Survey Area, outside the Site and Works Area, often where the land is subject to ground disturbance. To the south-east of the Site, this habitat comprises abundant Yorkshire fog (*Holcus lanatus*) and meadow grass (Poa sp.), with scattered black medic (*Medicago lupulina*), common bird's-foot trefoil (*Lotus corniculatus*) and occasional dock (Rumex sp.). In other areas, thistle (Cirsium sp.), common nettle

(*Urtica dioica*), soft rush (*Juncus effusus*), buttercup (Ranunculus sp.) and sweet vernal-grass (*Anthoxanthum odoratum*) frequently occur.

3.1.7 The southern limit of the Works Area incorporates a jetty, which potentially provides nesting habitat for breeding sea birds. This includes black guillemot (*Cepphus grylle*) in particular, recognising that this species nests in cavities in man-made structures, such as jetties, piers and harbour walls and breeds in notable numbers around the western coast of Scotland.

3.1.8 There is a single stand of Rhododendron sp. (NGR NS 17874 50784), an invasive non-native species, in the southern part of the Survey Area. This species has previously been recorded at the Site by biodiversity monitoring to inform the HNB Land Management Annual Reviews (LMARs) and is subject to ongoing management by the Applicant.

3.1.9 Evidence of otter activity recorded during the survey is marked on **Figure 3.2** and summarised in the accompanying Target Notes (see **Appendix B).** Otter activity continues to be focused on the coastline to the west and north-west of the Site boundary. No evidence of badger activity was recorded.

3.2 Preliminary Roost Assessment

3.2.1 A total of 37 buildings are categorised as suitable (moderate or low suitability) for roosting bats, as summarised in **Table 3.1**. The locations of buildings that are potentially suitable for roosting bats are shown on **Figure 3.3**. These buildings and the associated features that are potentially suitable for roosting bats remain largely unchanged since the previous bat surveys (Wood 2020a), with a small number of exceptions:

- Buildings 177 ,178 and 207 have been demolished and removed from the Site; and
- Buildings 027, 227 and 229 were previously categorised as having low suitability for roosting bats, however, no potential roost features associated with these buildings were apparent and they are no longer likely to provide suitable roost habitat.

Table 3.1 Preliminary Roost Assessment (categorisation of roost suitability)

Moderate	Low	Low to negligible*
197, 224	35, 42, 108, 115, 118, 142, 152, 153, 207, 212, 216, 228, 231, 248.	28, 31, 102, 119, 123, 139, 147, 160, 161, 162, 172, 175, 176, 180, 186, 189, 190, 192, 203, 214, 239

** Buildings with 'Low' suitability are further subdivided to identify those with 'Low to negligible' suitability for roosting bats i.e. those with limited potential roost features that are prone to elevated light and noise (machinery) disturbance.*

4. Conclusions

4.1.1 The habitats within the Site predominantly comprise hard standing and buildings, amenity grassland, ephemeral/short perennial vegetation and poor-semi-improved grassland, with bordering areas of broadleaved woodland planation, scattered broadleaved trees, and patches of tall ruderal vegetation. These habitats are likely to be of limited biodiversity conservation importance.

4.1.2 The habitats around the perimeter of the Site predominately comprise improved grassland and poor semi-improved grassland, which are also typically of limited biodiversity conservation importance.

4.1.3 The distribution, extent and character of habitats within the Site and around the Site perimeter is similar to that recorded by the previous Phase 1 Habitat survey (Wood 2019a) and only a small number of limited changes to these habitats are apparent. This includes an increase in gorse scrub cover adjacent to and outside of the south-east boundary of the Site, along with a newly planted hedgerow. Areas previously marked as ephemeral short perennial vegetation, also beyond/outside the south-east boundary of the Site, are now categorised as improved grassland.

4.1.4 Additional areas of habitat included within the Survey Area, as a result of iteration of the Works Area, are mainly extensions to habitats within other parts of the Survey Area. This includes broadleaved semi-natural woodland, east of Power Station Road towards the jetty. There are patches of marshy grassland, dominated by common reed and/or reed canary-grass within the Survey Area, the largest also being east of the road to the jetty. There are also areas of poor semi-improved grassland to the south and west of the Survey Area. These additional areas of habitat are all outside of the Site and Works Area.

4.1.5 A total of 37 buildings within the Site are categorised as suitable (moderate to low suitability) for roosting bats. A number of limited changes in the suitability of buildings for roosting bats between 2019 and 2022 were recorded. Three buildings have been demolished and three buildings previously categorised as being of low suitability for roosting bats are no longer suitable due to an absence of potential roost features.

4.1.6 Otter activity continues to be focused on the coastline to the west and north-west of the Site boundary and no evidence of badger activity was recorded.

4.1.7 Overall, there have been no substantive changes in the baseline status of terrestrial habitats within the Site and Works Area. Biodiversity monitoring to assess progress against the HNB ILMP[2], reported through Land Management Annual Reviews[13] (LMARs), has also not detected any shift in the biodiversity baseline. It is therefore likely that there have been no substantive changes in the baseline status of populations of otter, bats, badger or birds since the Baseline Surveys were completed in 2019, notwithstanding minor/background interannual fluctuations in species populations/assemblages. The baseline reports are therefore concluded to remain valid.

4.1.8 The southern limit of the Works Area however incorporates a jetty, which potentially provides nesting habitat for breeding sea birds. This includes black guillemot (*Cepphus grylle*) in particular, recognising that this species nests in cavities in man-made structures, such as jetties, piers and harbour walls, with notable numbers breeding along the western coast of Scotland. Therefore, further survey work in 2023 will assess the use of the jetty by breeding seabirds and update the baseline (Wood 2020b).

13 EDF Energy Nuclear Generation Ltd (2013 to 2021). Hunterston B Land Management Annual Review.

Appendix A
Figures

Appendix B
Target Notes

Table B.1 Target Notes

Target Note (see Fig. 3.2)	Evidence of otter activity	Grid Reference	Description	Photograph
1	Holt	NS 17822 51528	2019 - Otter holt under large slabs of concrete. Sheltered alcove extends back two to 3 m. At least four spraints (recent and old) inside the sheltered alcove. 2022 – Holt remains. No spraints.	
2	Holt	NS 17897 51582	2019 - Otter holt in sheltered alcove beneath large boulders. Two potential entrances. One fresh and one old spraint inside alcove. 2022 – Holt remains; at least three spraints inside.	
3	Holt	NS 17906 51586	2019 - Otter holt in sheltered alcove under large boulders. One fresh otter spraint at entrance. 2022 – Holt remains. No spraints evident.	
4	Couch	NS 17892 51578	2019 - Otter couch under two leaning rocks; open to the elements on both sides. Fresh and old spraint within the feature. 2022 – Couch remains. No spraints.	

Target Note (see Fig. 3.2)	Evidence of otter activity	Grid Reference	Description	Photograph
5	Potential Holt	NS 18087 51712	2019 - Potential otter holt under a large rock on the beach. One recent spraint inside alcove. 2022 – Holt remains. No spraints.	
6	Potential Holt	NS 17911 51568	2019- Potential otter holt under boulders on bankside. No field signs, however a large tunnel extends 2 to 2 m into the bank providing suitable shelter for otter. 2022 – remains as above.	
7	Otter habitat potential	NS 17776 51077	2019 - Coastal rock armour provides an extensive area of habitat suitable for otter sheltering and resting. Not surveyed in detail, due to health and safety constraints. 2022 – remains as above. Sea urchin remains (possible otter predation) on top of a concrete structure (NS 17738 51169).	 
8	Spraint	NS 18004 51630	2019 - Fresh spraint on rock. 2022 – No spraint evident.	
9	Potential holt	NS 18004 51630	2022 – Potential holt under boulders on upper shore with two entrances. No spraints evident.	N/a

Target Note (see Fig. 3.2)	Evidence of otter activity	Grid Reference	Description	Photograph
10	Spraint	NS 18076 51760	2022 – Spraint on rock on upper shore.	N/a
11	Spraint	NS 18131 51867	2022 – Three spraints on top of a line of boulders in the mid shore zone.	N/a

Key

- Indicative Dismantling Works Area ("Works Area")
- Nuclear Site Licence Boundary ("The Site")

0 100 200 300 m

Scale at A3: 1:5,000

Decommissioning of Hunterston B Nuclear Power Station
Verification of Biodiversity Baseline

Figure 1.1
HNB Indicative Dismantling Works Area

January 2023

217500

218000

651500

N

Stoney Port

Sks

Sewage Works

Groyne

Hards

MHWS

Little Brigurd

Slipway

Hard

ESS

Power Station

Key

- Indicative Dismantling Works Area ("Works Area")
- Nuclear Site Licence Boundary ("The Site")
- Scrub - scattered
- Parkland and scattered trees- broad-leaved
- Parkland and scattered trees - coniferous
- Fence
- Boundary removed
- Broadleaved woodland - plantation
- Mixed woodland - plantation
- Scrub - dense/continuous
- Scrub - scattered
- Parkland and scattered trees - broad-leaved
- Neutral grassland - semi-improved
- Improved grassland
- Poor semi-improved grassland
- Marsh/marshy grassland
- Tall ruderal
- Running water - brackish
- Running water
- Shingle/gravel above high-tide mark
- Rocks/boulders above high-tide mark
- Dune scrub
- Amenity grassland
- Ephemeral/short perennial
- Introduced shrub
- Buildings
- Other habitat
- Hardstanding

0 50 100 150 m

Scale at A3: 1:3,000

Decommissioning of Hunterston B Nuclear Power Station
Verification of Biodiversity Baseline

Figure 3.1
Phase 1 habitat map

January 2023

Key

- Indicative Dismantling Works Area ("Works Area")
- Nuclear Site Licence Boundary ("The Site")
- Scrub - scattered
- Parkland and scattered trees- broad-leaved
- Parkland and scattered trees - coniferous
- Running water
- Intact hedgerow
- Defunct hedge native species poor
- Fence
- Boundary removed
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - plantation
- Scrub - dense/continuous
- Scrub - scattered
- Parkland and scattered trees - broad-leaved
- Neutral grassland - semi-improved
- Improved grassland
- Poor semi-improved grassland
- Marsh/marshy grassland
- Tall ruderal
- Running water - brackish
- Running water
- Shingle/gravel above high-tide mark
- Dune scrub
- Amenity grassland
- Ephemeral/short perennial
- Introduced shrub
- Buildings
- Bare ground
- Hardstanding

0 50 100 150 m

Scale at A3: 1:3,000

Decommissioning of Hunterston B Nuclear Power Station
Verification of Biodiversity Baseline

Figure 3.1
Phase 1 habitat map

January 2023

217500

218000

651000

650500

Hard

Hard

Hawkingcraig

Plantation

Cave

Hawking Craig

Blue Stones

Bankend

Wood

4m

M L W S

Key

- Indicative Dismantling Works Area ("Works Area")
- Scrub - scattered
- Parkland and scattered trees- broad-leaved
- Parkland and scattered trees - coniferous
- Fence
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - plantation
- Parkland and scattered trees - broad-leaved
- Poor semi-improved grassland
- Marsh/marshy grassland
- Tall ruderal
- Rocks/boulders above high-tide mark
- Amenity grassland
- Buildings
- Hardstanding

0 50 100 150 m

Scale at A3: 1:3,000

Decommissioning of Hunterston B Nuclear Power Station
Verification of Biodiversity Baseline

Figure 3.1
Phase 1 habitat map

January 2023

X:\UK\DCEMA100-AT\T5\AT5-FS7-Shared2\Projects\808125 HNB & HPB EIADR\Deliver Stage\D Design_Technical\Drawings\ArcGIS\Hunterston B\MXD\852351-WSPE-XX-XX-FG-OE-00008_S2_P01.2.mxd Originator: UKJXP782

218000 218500 219000

652000 651500 651000

N

Outfall
Drain
Drain
Drain
Hillhouse
Hillhouse Plantation
Sks
Iss
Stoney Port
Sewage Works
Groyne
Hards
MHWS
Power Station
Path
Shaw Wood
Little Brigurd
Slipway
ESS
Hard
Hard
Broomcraigs Plantation
Campbelton
Reservoir (cov)
Campbelton Hill
Drain
Drain
Hawkingcraig Plantation
Cave
Sks
Iss
4m
6m
18m
22m
33m
36m
40m
35m
26m
10m
76m
5m

1 2 3 4 5 6 7 8 9 10 11

Key

- Indicative Dismantling Works Area ("Works Area")
- Nuclear Site Licence Boundary ("The Site")
- Holt
- Potential holt
- Couch
- Potential otter rest sites (holts/couches)
- Spraint
- Target note

0 100 200 300 m

Scale at A3: 1:5,000

Decommissioning of Hunterston B Nuclear Power Station
Verification of Biodiversity Baseline

Figure 3.2
Evidence of otter activity

November 2023

218000

218500

651500

651000

N

Stoney Port

Sks

Iss

Sewage Works

Groyne

Power Station

HUNTERSTON 'A'

ESS

Path

Reservoir (cov)

18m

22m

33m

36m

40m

35m

10m

214 147 197 197 216 152 123 229 142 31 28 228 192 203 160 27 227 190 42 35 224 189 207 172 175 239 176 139 180 248 102 162 119 118 118 132 115 212 108 161 153 231 186

Key

Indicative Dismantling Works Area ("Works Area")

Nuclear Site Licence Boundary ("The Site")

Bat Roost Suitability

Moderate

Low

Low to negligible

Note: All other buildings have negligible bat roost suitability.

0 100 200 m

Scale at A3: 1:3,500

Decommissioning of Hunterston B Nuclear Power Station
Verification of Biodiversity Baseline

Figure 3.3
Bat roost suitability - buildings

January 2023

Appendix 8H: Breeding Bird Survey Update and Verification Report

November 2023

Technical note:
Breeding birds: baseline verification and update

1. Introduction

1.1 Background

1.1.1 EDF Energy Nuclear Generation Limited (EDF) is applying for consent from the Office for Nuclear Regulation (ONR) to decommission Hunterston B Nuclear Power Station ('HNB'). The decommissioning works (the 'Proposed Works') will include the dismantling and deconstruction of buildings and structures in areas within and outside of the Nuclear Site License ('NSL') boundary that are part of the power station. An Indicative Dismantling Works Area (the 'Works Area') has been identified to delineate these areas. The land within the HNB NSL boundary is referred to as 'the Site'. The Site and Works Area boundaries are shown on **Figure 1, Annex A**.

1.1.2 To inform the Ecological Impact Assessment (EcIA), as part of the Environmental Impact Assessment (EIA), of the Proposed Works, a suite of ecological surveys was carried out in 2019 and 2020, including habitat surveys and surveys of birds, otter, badger and bats. These are collectively referred to as the 'Baseline Surveys'. The Baseline Surveys are detailed in separate reports ('Baseline Reports'). The Baseline Surveys and survey reports, combined with desk-based studies of other biodiversity information collected from the Site and surrounding area, establish the terrestrial biodiversity baseline against which the predicted effects of the Proposed Works on ecological features are to be assessed.

1.2 Purpose of this report

Baseline verification (breeding birds)

1.2.1 A period of over two years has elapsed since the completion of the Baseline Surveys and the area delineated as the Works Area has been refined, mainly to include marine infrastructure associated with HNB. This includes a jetty (including cooling water intake) and the access route to it; and the cooling water outlet tunnel (including cooling water outfall). This extends the Works Area to the south of the Site and into the Firth of Clyde to the west (**Figure 1, Annex A**).

1.2.2 The Baseline Surveys included a habitat survey completed in 2019. This was updated in 2022. The main purpose of the survey update was to determine whether the terrestrial biodiversity baseline, derived by the previous survey work and desk-based study, remains valid to inform the EcIA. This is referred to as 'Baseline Verification'.

1.2.3 Baseline Verification is reported separately in **Appendix 8G**[1] and concludes that there have been no substantive changes in the baseline status of terrestrial habitats within the Site and Works Area. It also concludes therefore that there are likely to have been no

[1] WSP Environment & Infrastructure Solutions UK Limited (2023). *Decommissioning of Hunterston B Nuclear Power Station: Verification of Terrestrial Biodiversity Baseline*.

substantive changes in the baseline status of species populations since the Baseline Surveys were completed in 2019.

1.2.4 This technical note details a further walkover survey of the Works Area and accessible adjacent areas by an ornithologist, focusing on those areas that were not surveyed in 2019. This survey recorded and mapped breeding bird activity and was completed to further verify the conclusion that the characterisation of the biodiversity baseline, reported in the breeding and non-breeding birds baseline report[2], remains valid.

Baseline update (black guillemot)

1.2.5 Man-made marine structures such as jetties, piers and harbour walls provide nesting sites for marine seabirds, including black guillemot (*Cepphus grylle)*. This type of infrastructure has allowed this species to colonise new sites around the Irish Sea. Approximately half of the UK's population of this species breeds around the Northern Isles, with the remainder confined mainly to the coasts and islands of north and west Scotland[3]. The west coast of Scotland can therefore support black guillemot colonies that are of national importance.

1.2.6 The Works Area includes elements of marine infrastructure, including a jetty. Baseline Verification therefore identified the requirement for further survey work to assess the use of the jetty by breeding seabirds and update the biodiversity baseline, with particular focus on black guillemot. This survey work, along with surveys of other marine infrastructure in proximity to the Works Area, is detailed in this technical note, updating the biodiversity baseline reported in the breeding and non-breeding birds baseline report.

1.3 Study Area

1.3.1 The Study Area includes the Works Area and accessible adjacent areas within approximately 100 m, focusing on those areas that were not previously surveyed in 2019. The Study Area is extended to include offshore infrastructure in proximity to the Works Area that is suitable for nesting seabirds (**Figure 1, Annex A**).

1.3.2 The terrestrial habitats within the Study Area are similar to (and adjoining) those previously surveyed for breeding birds in 2019. The two structures within the Study Area that are potentially suitable nesting sites for seabirds include a jetty and a small offshore platform. The jetty is at the southern limit of the Works Area, extending approximately 175 m into the Firth of Clyde. The platform is approximately 150 m offshore and <200 m from the Works Area, situated to the south-west of the cooling water outlet tunnel and outfall. Both structures are labelled on **Figure 1, Annex A**.

[2] Wood (2020b). *Hunterston B Decommissioning EIA - Baseline Report: Breeding and Non-breeding Birds*. Document Reference: 41491-WOD-XX-XX-RP-OE-0015_S4_P01

[3] JNCC (2020) Black guillemot (*Cepphus grylle*). (Online) Available at: https://jncc.gov.uk/our-work/black-guillemot-cepphus-grylle/#distributionabundance (Accessed November 2023).

2. Methodology

2.1 Baseline verification (breeding birds)

Survey objectives

2.1.1 The objective of the survey was to collect data on the breeding bird community within the Study Area, including estimating the number of territories/breeding pairs of each species within this area. This is with a view to providing further verification of the conclusion that the characterisation of the biodiversity baseline (breeding birds), reported in the baseline report (breeding and non-breeding birds[2]), remains valid to inform the EcIA.

Data collection methods

2.1.2 A walkover survey of a transect route through the Study Area (**Figure 1**, **Annex A**) was completed by an experienced Ornithologist, using binoculars, on 16 May 2023. The survey was limited to a single transect survey, recognising that the characterisation of the baseline status of breeding birds at the Site and perimeter areas in 2019 was informed by a full suite of six separate surveys, spread throughout the birds' breeding season.

2.1.3 Breeding bird activity was mapped based on the British Trust for Ornithology (BTO) Common Bird Census (CBC) methodology (Marchant[4] and Gilbert *et al.*[5]). The location of each bird detected (visually and/or aurally) was mapped using standard two-letter BTO Codes. Bird activity was also recorded using standard behaviour codes[4].

2.1.4 The survey was completed throughout the morning, finishing by early afternoon, in appropriate weather conditions and avoiding periods of strong wind and/or heavy rain, recognising that bird song/activity tends to decline in late morning.

Data collection locations

2.1.5 The survey transect was defined to target suitable habitats for breeding birds throughout the Study Area, which included woodland, scrub, grassland and coastal habitats. The transect route is detailed alongside the survey results in **Section 4**.

Data analysis

2.1.6 Bird activity recorded during the survey was mapped, with the presence of a singing/displaying bird, or a pair of birds in potential nesting habitat, treated as signifying a breeding territory. Other bird sightings/records are treated as indicative of a species holding territory with the potential to breed in the vicinity. This data on the number, distribution and behaviour of bird species characterises the breeding bird assemblage within the Study Area on the survey date.

[4] Marchant, J.H. (1983). *BTO Common Bird Census instructions*, BTO, Tring.
[5] Gilbert, G., Gibbons, D.W., and Evans, J. (1998). *Bird Monitoring Methods*. RSPB; London.

2.2 Baseline update (black guillemot)

Survey objectives

2.2.1 The purpose of the survey was to determine the number of breeding pairs of black guillemot on two marine structures (jetty and offshore platform) identified as potential nesting habitat for this species, also recording juvenile and non-breeding birds and other nesting seabird species. This information updates the biodiversity baseline (breeding birds).

Data collection locations

2.2.2 In addition to the transect survey of breeding bird activity (**Section 2.2**), surveys were completed from four Vantage Points (VPs), each with a viewshed of 450 m (radius) and 180°arc of view. The 450 m survey radius reflects the proximity of the VPs and avoids duplication of survey results, whilst capturing the recommended 300 m recording distance from colonies (Gilbert *et al.* 1998[5]).

2.2.3 VP locations and the extent of the associated viewsheds are shown in **Figure 2, Annex A.** Two of the VPs (VPs 1 & 2) afforded views of the north side and underside of the jetty respectively, whilst VPs 3 & 4 afforded two different views to the offshore platform.

Data collection methods

2.2.4 Counts ('core counts') of black guillemot on the jetty were completed by close approach to this structure during the transect survey in May and prior to each VP survey in June and July. Black guillemot observations were also recorded along other parts of the shoreline during the transect survey (**Section 2.2**)**.** All surveys were completed by experienced ornithologists, using binoculars and a telescope.

2.2.5 The VP survey method was adapted from guidance outlined in the Seabird Monitoring Handbook (Walsh *et al*. 1995[6]). In addition to core counts of birds on the jetty in May, June and July, static surveys of the two structures were completed from all four VP locations on both 16 June 2023 and 11 July 2023. The timing and duration of the surveys at each VP location, on each of the survey dates, is summarised in **Table 2.1**.

2.2.6 The surveys primarily monitored the activity of perched bird(s) to determine the number and location of Apparently Occupied Nests (AONs). Any behaviour/observation indicative of nesting birds or rearing of young was also recorded: copulation; nest change-over by adults; adults bringing fish for chicks; guano at the nest edge; and fledged juveniles.

2.2.7 Breeding status of individual birds was also determined, adapting established black guillemot survey methods (Ewins 1985a[7] and 1985b[8]; and Tasker et al. 1983[9]), whereby adult birds in full summer plumage on land are concluded to form part of a breeding colony.

[6] Walsh, P.M. Halley, D.J., Harris, M. P., del Nevo, A., Sim, I.M.W., & Tasker, M.L. (1995). *Seabird monitoring handbook for Britain and Ireland*. JNCC / RSPB / ITE / Seabird Group, Peterborough.
[7] Ewins, P. J. (1985a). *Results of Tystie Cepphus Grylle pre-breeding distribution surveys in Shetland, 1982-1984, with monitoring recommendations*. Report to Shetland Oil Terminal Environmental Advisory Group, unpublished.
[8] Ewins, P. J. (1985b). *Colony attendance and censusing of black guillemots Cepphus grylle in Shetland*. Bird Study 32: pp176-185.
[9] Tasker, M.L. & Reynolds, P. (1983). *A study of Tystie (Black guillemot) Cephus Grylle distribution in Orkney, April,1983*. Nature Conservancy Council, NE Scotland regional report Rep.1.

2.2.8 Nesting behaviour by other seabirds was also recorded, along with gull presence or activity potentially threatening to black guillemots.

Table 2.1 VP survey timing and duration

Vantage Point	16 June 2023	11 July 2023
VP1	08:37 to 11:38	10:30 to 12:00.
VP2	12:08 to 15:08	08:30 to 10:00
VP3	08:35 to 11:35	08:15 to 09:45
VP4	12:05 to 15:05	10:15 to 11:45

Data analysis

2.2.9 The number of AONs/breeding birds was estimated and this data is compared against information on regional and national populations to determine the relative biodiversity conservation importance of the bird numbers/population within the Study Area.

3. Constraints

3.1 Baseline verification (breeding birds)

3.1.1 The CBC method identifies numbers of territory-holding birds during the breeding season and does not confirm that breeding has taken place at locations within the Study Area, which would require nests with eggs/young to be identified for many species. The latter is however not required to inform the EcIA.

3.1.2 It is standard practice to complete breeding bird surveys by noon. Site access and health and safety protocols resulted in the survey commencing after 08:00 am, with survey completion in the early afternoon. The majority of the survey was however completed prior to noon.

3.2 Baseline update (black guillemot)

3.2.1 No black guillemot surveys of the two potential nesting locations were completed in April or early May, which is a core part of the recommended survey period. Surveys were, however, extended into June and July, when fledgling birds generally remain dependent on their parents. The commencement of surveys in mid-May is therefore unlikely to have resulted in an underestimate of the numbers of guillemot pairs/nests.

3.2.2 The western (seaward facing) aspect of the jetty and offshore platform was not visible during the survey, with a risk that any breeding bird activity at these parts of the two structures could be undetected or under recorded. Flight activity recorded by the VP surveys did not however indicate notable bird activity associated with either of the western aspects and therefore restricted visibility is unlikely to have resulted in a substantive underestimate of numbers of guillemot pairs/nests.

3.2.3 Breeding/breeding success and productivity could not be confirmed definitively at most of the AONs, due to limited visibility of AONs from the VPs. Recording adult birds in breeding plumage however provides an adequate indication of numbers of breeding guillemot.

3.2.4 The peak period for black guillemot activity is 06:00 and 09:00. Site access restrictions resulted in VP surveys commencing around 08:00, with a risk that two thirds of activity by breeding pairs could have been overlooked. The combined duration of the VP surveys of each structure (6 hours in June and 3 hours in July), combined with observations during the walkover/transect survey in May, is however likely to have avoided an underestimate of the numbers of guillemot pairs/nests.

4. Results

4.1 Baseline verification (breeding birds)

4.1.1 The survey transect is marked on **Figure 3** (**Annex A**), along with the survey results. A total of 35 bird species (breeding and non-breeding) were recorded. The majority of these were also recorded by the baseline breeding bird surveys in 2019, the only exceptions being gannet (*Morus bassanus*), nuthatch (*Sitta europaea*), pink-footed goose (*Anser brachyrhynchus*), raven (*Corvus corax*) and reed warbler (*Acrocephalus scirpaceus*). Reed warbler is the only one of these five new species that was recorded breeding.

4.1.2 A total of 11 species were recorded breeding or likely to be breeding (displaying breeding behaviour) within the Study Area, six of which were previously recorded breeding by the baseline surveys in 2019. This includes a single breeding territory each of blackbird (*Turdus merula*), lesser black-backed gull (*Larus fuscus*), robin (*Erithacus rubecula*) and willow warbler (*Phylloscopus trochilus*); and two breeding territories each of whitethroat (*Sylvia communis*) and wren (*Troglodytes troglodytes*).

4.1.3 The other five species recorded as breeding or likely to be breeding were not recorded breeding in 2019. In addition to breeding black guillemot (**Section 4.2**), this includes a single breeding territory each of shelduck (*Tadorna tadorna*), blackcap (*Sylvia atricapilla*) and mistle thrush (*Turdus viscivorus*) and two breeding territories of reed warbler (*Acrocephalus scirpaceus*).

4.1.4 Mistle thrush is included on the Red List of Birds of Conservation Concern (Stanbury et al., 2021[10]) and was recorded within the woodland to the south-east of the Study Area. Shelduck is on the Amber List and is of medium conservation concern, with only one pair recorded loafing along the sand/mud shore. This species nests in burrows and is unlikely to nest within the Study Area due to a lack of suitable nesting habitat. Blackcap and reed warbler are on the Green List and of comparatively low conservation concern.

4.1.5 Reed warbler and whitethroat (Amber List) were recorded exhibiting breeding behaviour within 50 m of the Works Area, whereas breeding activity of the other species was confined to woodland/scrub edge approximately 50 m to 100 m from the Works Area. Other species, recorded by visual observation and contact calls, could not be confirmed as breeding or likely to be breeding within the Study Area.

[10] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021). *The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain*. British Birds 114: 723-747. (online) Available at: https://britishbirds.co.uk/content/status-our-bird-populations (Accessed November 2023).

4.2 Baseline update (black guillemot)

4.2.1 Seven apparently occupied nests (AONs) were recorded during the VP surveys, four on the jetty frame (TY 1-4) and three on the offshore platform (TY 5-7). The locations of the nests are shown in **Figure 4 (Annex A)**, including photographs of TY5 ('crane wheel nest'), TY6 ('wheel nest') and TY7 ('box nest'). Breeding was confirmed (fresh guano deposits at the nest entrance) at one location (TY1). There were no observations of fledged juveniles.

4.2.2 A peak count of seven adult birds in summer plumage was recorded at the offshore platform and/or in the water immediately below it on 11 July, with a peak count of 11 birds at the jetty on the same day. Although seven AONs were recorded representing seven pairs (14 birds), it is concluded that the peak count was 18 birds on a precautionary basis.

4.2.3 No other species was recorded nesting on either structure. A large, old nest on the offshore platform was potentially attributable to greater black-backed gull, however the nest appeared to be unoccupied/inactive.

5. Conclusion

5.1 Baseline verification (breeding birds)

5.1.1 A total of 35 bird species (breeding and non-breeding) were recorded. The majority of these were also recorded by the baseline breeding bird surveys in 2019, the only exceptions being gannet (*Morus bassanus*), nuthatch (*Sitta europaea*), pink-footed goose (*Anser brachyrhynchus*), raven (*Corvus corax*) and reed warbler (*Acrocephalus scirpaceus*). Reed warbler is the only one of these five that was recorded breeding.

5.1.2 A total of 11 species were recorded as breeding or likely to be breeding within the Study Area, six of which were previously recorded breeding in 2019. In addition to breeding black guillemot (**Section 4.2**), the breeding species that were not recorded in 2019 include a single breeding territory each of shelduck, blackcap and mistle thrush and two breeding territories of reed warbler. Shelduck is however unlikely to nest within the Study Area.

5.1.3 The habitats within the Study Area are similar to, and extensions of, the habitats within the Site and perimeter area, which w~~as~~ere surveyed in 2019. There have been no substantive changes in the baseline status of terrestrial habitats within the Site and Works Area since then and the assemblage of breeding birds recorded within the Study Area compares closely to that recorded by the baseline surveys in 2019. It is therefore likely that there have been no substantive changes in the baseline status of breeding bird populations within the Site, Works Area and/or perimeter areas. The baseline (breeding birds) as set out in the baseline report (breeding and non-breeding birds) is therefore concluded to remain valid.

5.2 Baseline update (black guillemot)

5.2.1 Black guillemot is on the Amber List of Birds of Conservation Concern[10]. Within the Ayrshire region, the most recent survey ('Seabird 2000'), indicated an upward trend in the

population to 372 breeding birds[11], with the Scottish breeding population estimated at 37,500 birds (18,750 pairs).

5.2.2 Seven breeding pairs (AONs) were recorded on the jetty and offshore structure combined, equating to 14 birds or 3.76 % of the regional (Ayrshire) population and 0.037 % of the Scottish breeding population. Taking a more precautionary approach, and the peak count of 18 breeding birds recorded in July, this increases to 4.8 % and 0.048 % respectively.

5.2.3 The breeding assemblage of black guillemot within the Study Area is likely to be of local biodiversity conservation importance. However, as the upper estimate of 18 birds is approaching 5% of the Ayrshire population, the assemblage is concluded to be of County-level importance on a precautionary basis.

[11] Forrester, R.W., Andrews, I. J., McInerny, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine, D. C., & Grundy, D.S. (eds). (2007). *The Birds of Scotland*. The Scottish Ornithologists' Club, Aberlady.

Annex A
Figures

Issued by

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Approved by

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Document revisions

No.	Details	Date
01	Draft	August 2023
02	Final	November 2023

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217000 217500 218000 218500 219000

652000 651500 651000 650500

N

Platform

Jetty

Sand
Inner Brigurd Point
Outfall
Outfall
Drain
Drain
Drain
Hillhouse
Hillhouse Plantation
Sks
Iss
Stoney Port
Hunterston House
Sewage Works
Groyne
Hards
MHWS
Power Station
Little Brigurd
Path
Sks
Shaw Wood
Drain
Central Cottage
Slipway
ESS
Broomcraigs Plantation
Hard
Hard
18m
22m
33m
36m
Campbelton Wood West
Reservoir (cov)
40m
35m
Campbelton Hill
76m
Campbelton Farm
Drain
Drain
Hawkingcraig Plantation
Sks
Iss
Spr
Goldenberry Plantation
Brackenbank Plantation
Campbelton Wood East
Drain
Path
Hawking Craig
MLWS
Blue Stones
Bankend Wood
Ardneil Bank Wood
Mast
140m
Goldenberry Hill
Iss
Drain
The Three Sisters
Drain

Key

- Nuclear Site Licence Boundary ("The Site")
- Indicative Dismantling Works Area ("Works Area")
- Breeding Bird Survey (2023)

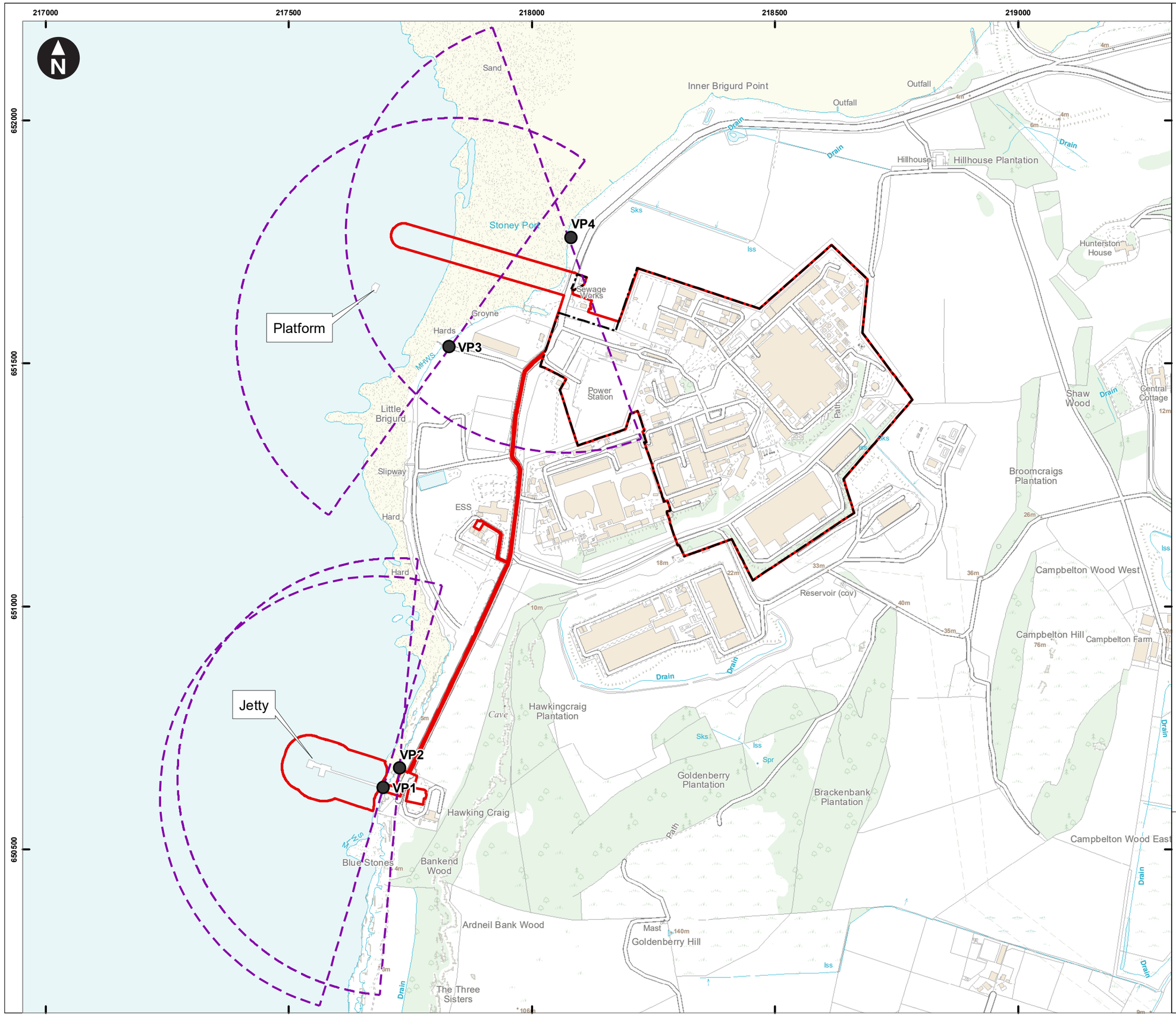
0 100 200 300 400 m

Scale at A3: 1:7,500

Decommissioning of Hunterston B Nuclear Power Station
Breeding Birds: baseline verification and update

Figure 1
Study Area (2023)

August 2023



Decommissioning of Hunterston B Nuclear Power Station
Breeding Birds: baseline verification and update

Figure 2
Vantage point survey

August 2023

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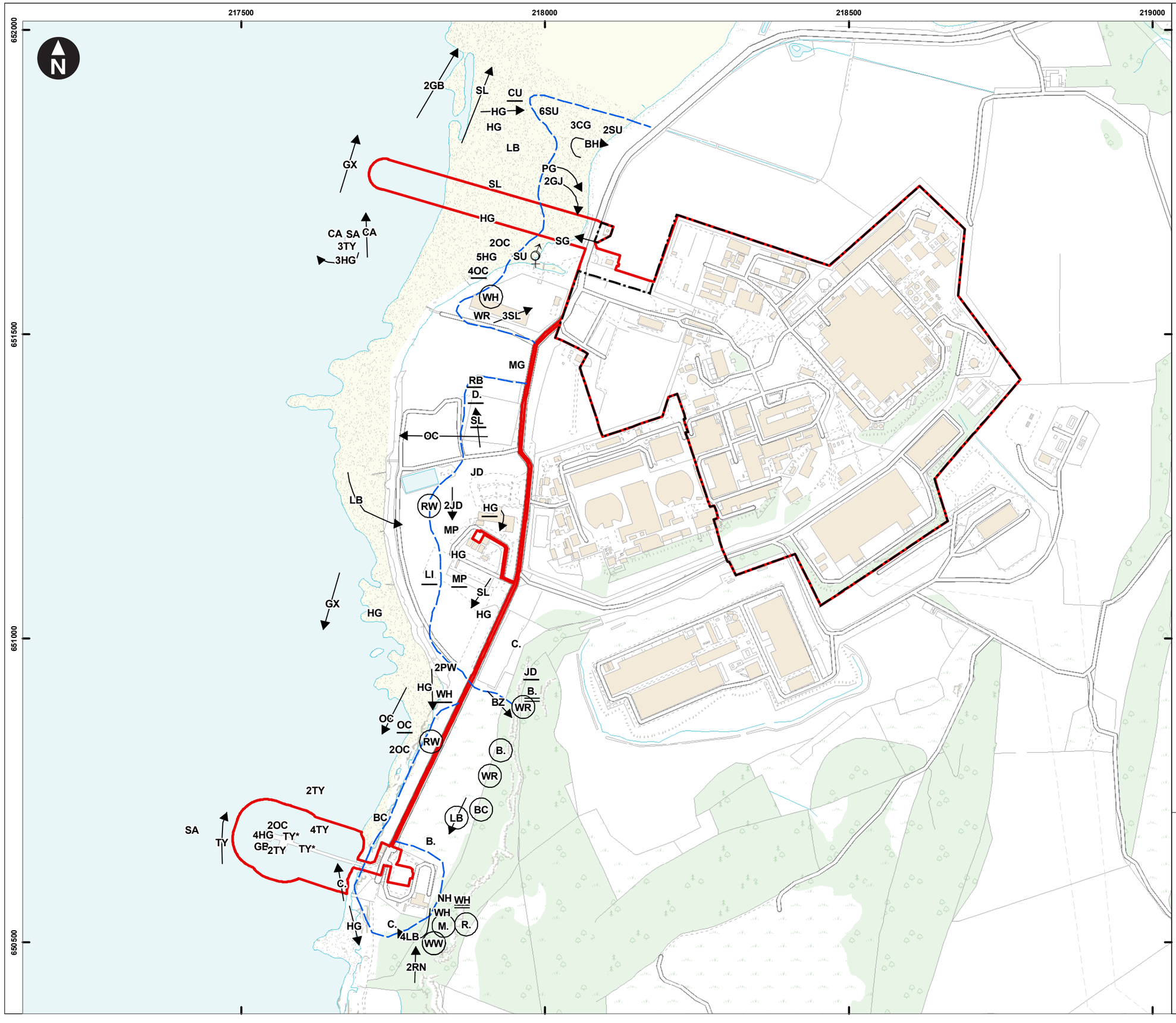

Key

- Indicative Dismantling Works Area ("Works Area")
- Nuclear Site Licence Boundary ("The Site")
- Survey transect
- Bird in song
- Flight
- Calling
- Distressed / alarm calling bird

BTO Code and Species

B.	Blackbird
BC	Blackcap
BH	Black-headed gull
BZ	Buzzard
C.	Carrion crow
CA	Cormorant
CG	Canada goose
CU	Curlew
D.	Dunnock
GB	Great black-backed gull
GJ	Greylag goose
GX	Gannet
HG	Herring gull
JD	Jackdaw
LB	Lesser black-backed gull
LI	Linnet
M.	Mistle thrush
MG	Magpie
MP	Meadow pipit
NH	Nuthatch
OC	Oystercatcher
PG	Pink-footed goose
PW	Pied wagtail
R.	Robin
RB	Reed bunting
RN	Raven
RW	Reed warbler
SA	Shag
SG	Starling
SL	Swallow
SU	Shelduck
TY	Black guillemot
WH	Whitethroat
WR	Wren
WW	Willow warbler

0 100 200 300 m

Scale at A3: 1:6,000

Decommissioning of Hunterston B Nuclear Power Station
Breeding Birds: baseline verification and update

Figure 3
Bird activity (16 May 2023)

August 2023

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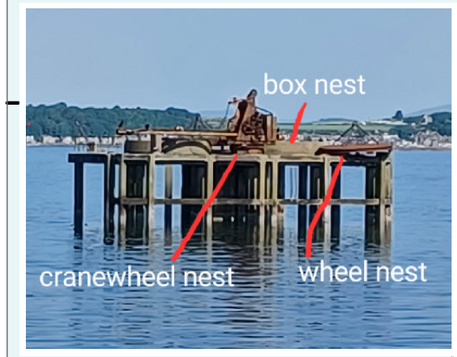
651500 651000

TY7 Box nest
TY5 Cranewheel nest
TY6 Wheel nest



TY1
TY4
TY3
TY2

Stoney Port
Sks
Iss
Sewage Works
Groyne
Hards
MHWS
Power Station
Path
Little Brigurd
Slipway
ESS
Hard
Hard
18m
22m
33m
40m
10m
Reservoir (cov)
Drain
Drain
5m
Cave
Hawkingcraig Plantation
Sks
Iss
Spr
Goldenberry Plantation
Brackenbank Plantation
Hawking Craig
Path

Key

- Indicative Dismantling Works Area ("Works Area")
- Nuclear Site Licence Boundary ("The Site")
- Black Guillemot nest
- Black Guillemot nest with confirmed breeding

0 100 200 m

Scale at A3: 1:5,000

Decommissioning of Hunterston B Nuclear Power Station
Breeding Birds: baseline verification and update

Figure 4
Black guillemot nests

August 2023

852351-WSPE-XX-XX-FG-OE-00031_S2_P01

10.

Coastal Management and Water Quality

Appendix 10A: Results from the Water Quality Surveys

Appendix 10A
Results from the water quality surveys

Quarter 1- April 2021

Table 10A.1 Hunterston B in-situ water quality results (averaged)

Depth(m)	Temperature (°C)	Salinity (salinity units)	Electrical conductivity (mS/cm)	Dissolved Oxygen (mg/l)
1	8.49	25.56	40.29	10.83
2	8.23	25.60	40.43	10.70
3	8.16	25.24	39.21	11.29

Table 10A.2 Hunterston B total suspended solids results

Depth (m)	Total Suspended Solids (mg/l)
1	37.60
2	46.90
3	49.70

Table 10A.3 Hunterston B nutrient water quality results

Depth (m)	Total ammoniacal nitrogen (as NH3) (mg/l)	Nitrate (as NO3-) (mg/l)
1	<0.2	<1.5
2	<0.2	<1.5
3	<0.2	<1.5

Table 10A.4 Hunterston B trace metals water quality results

Depth (m)	Arsenic (mg/l)	Lead (mg/l)	Cadmium (mg/l)	Mercury (mg/l)	Chromium (mg/l)	Nickel (mg/l)	Copper (mg/l)	Zinc (mg/l)
1	<0.012	<0.006	<0.003	<0.00002	<0.018	<0.006	<0.006	<0.03
2	<0.012	<0.006	<0.003	<0.00002	<0.018	<0.006	<0.006	<0.03
3	<0.012	<0.006	<0.003	<0.00002	<0.018	<0.006	<0.006	<0.03

Quarter 2- August 2021

Table 10A.5 Hunterston B in-situ water quality results (averaged)

Depth(m)	Temperature (°C)	Salinity (salinity units)	Electrical conductivity (mS/cm)	Dissolved Oxygen (mg/l)
1	15.28	26.77	41.76	8.89
2	15.28	26.77	41.75	8.85
3	15.28	26.77	41.75	8.97

Table 10A.6 Hunterston B total suspended solids results

Depth (m)	Total Suspended Solids (mg/l)
1	33.3
2	31.9
3	35.4

Table 10A.7 Hunterston B nutrient water quality results

Depth (m)	Total ammoniacal Nitrogen (as NH3) (mg/l)	Nitrate (as NO3-) (mg/l)
1	<0.2	<0.3
2	<0.2	<0.3
3	<0.2	<0.3

Table 10A.8 Hunterston B total metals water quality results

Depth (m)	Arsenic (mg/l)	Lead (mg/l)	Cadmium (mg/l)	Mercury (mg/l)	Chromium (mg/l)	Nickel (mg/l)	Copper (mg/l)	Zinc (mg/l)
1	<0.012	<0.006	<0.003	<0.00002	<0.018	<0.006	<0.006	0.0595
2	<0.012	0.00647	<0.003	<0.00002	<0.018	<0.006	<0.006	<0.03
3	<0.012	<0.006	<0.003	<0.00002	<0.018	<0.006	<0.006	<0.03

Quarter 3- November 2021

Table 10A.9 Hunterston B in-situ water quality results (averaged)

Depth(m)	Temperature (°C)	Salinity (salinity units)	Electrical conductivity (mS/cm)	Dissolved Oxygen (mg/l)
1	12.58	26.05	40.81	8.50
2	12.81	26.12	40.83	8.62
3	12.56	26.08	40.82	8.83

Table 10A.10 Hunterston B total suspended solids results

Depth (m)	Total Suspended Solids (mg/l)
1	32.3
2	39.3
3	34.4

Table 10A.11 Hunterston B nutrient water quality results

Depth (m)	Ammoniacal Nitrogen (as NH3) (mg/l)	Nitrate (as NO3-) (mg/l)
1	<0.2	<0.3
2	<0.2	<0.3
3	<0.2	<0.3

Table 10A.12 Hunterston B total metals water quality results

Depth (m)	Arsenic (mg/l)	Lead (mg/l)	Cadmium (mg/l)	Mercury (mg/l)	Chromium (mg/l)	Nickel (mg/l)	Copper (mg/l)	Zinc (mg/l)
1	<0.012	<0.006	<0.003	<0.00002	<0.018	<0.006	<0.006	<0.03
2	<0.012	<0.006	<0.003	<0.00002	<0.018	<0.006	<0.006	<0.03
3	<0.012	<0.006	<0.003	<0.00002	<0.018	<0.006	<0.006	<0.03

Quarter 4- March 2022

Table 10A.13 Hunterston B in-situ water quality results (averaged)

Depth(m)	Temperature (°C)	Salinity (salinity units)	Electrical conductivity (mS/cm)	Dissolved Oxygen (mg/l)
1	6.92	24.52	38.96	11.63
2	7.14	24.83	39.4	11.95
3	7.07	25.02	39.68	11.89

Table 10A.14 Hunterston B total suspended solids results

Depth (m)	Total Suspended Solids (mg/l)
1	24.3
2	27.9
3	26

Table 10A.15 Hunterston B nutrient water quality results

Depth (m)	Ammoniacal Nitrogen (NH_3 (mg/l)	Nitrate (NO_3^-) (mg/l)
1	<0.2	<0.3
2	<0.2	<0.3
3	<0.2	<0.3

Table 10A.16 Hunterston B total metals water quality results

Depth (m)	Arsenic (mg/l)	Lead (mg/l)	Cadmium (mg/l)	Mercury (mg/l)	Chromium (mg/l)	Nickel (mg/l)	Copper (mg/l)	Zinc (mg/l)
1	<0.012	<0.006	<0.003	<0.00002	<0.018	<0.006	<0.006	0.036
2	<0.012	<0.006	<0.003	<0.00002	<0.018	<0.006	<0.006	<0.03
3	<0.012	<0.006	<0.003	<0.00002	<0.018	<0.006	<0.006	<0.03

Appendix 10B: Water Framework Directive Appraisal

Appendix 10B: Strategic Water Framework Directive Assessment

1. Introduction

1.1 Background

1.1.1 Hunterston B (HNB) Nuclear Power Station ceased generation of electricity in January 2022. Defueling of HNB commenced shortly after, which is anticipated to be complete in 2025. Decommissioning, namely the dismantling and decommissioning of plant and buildings within the HNB nuclear site license (NSL) boundary (the 'Site') and infrastructure associated with energy generation outside of the Site, is anticipated to start shortly after this.

1.1.2 Prior to the commencement of decommissioning activities at the Site, EDF Energy Nuclear Generation Limited (EDF), the current licensee of the Site, is legally required to gain consent to carry out the decommissioning project from the Office for Nuclear Regulation (ONR) under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended) (EIADR)[1].

1.1.3 The Scottish Environment Protection Agency (SEPA) requires an assessment of the impact of any works/modifications to water bodies in the UK under the European Union's Water Framework Directive (WFD) (2000/60/EC)[2]. For groundwater, the European Union's Groundwater Directive (GWD), 2006/118/EC[3] (a 'daughter directive' to the WFD) requires an assessment of the impact of any works on groundwater bodies through the introduction of hazardous substances and/or non-hazardous pollutants. Both the objectives of the WFD and GWD are implemented in Scotland through the Water Environment and Water Services (Scotland) Act (WEWS Act) 2003[4] and elements of the Pollution Prevention and Control (Scotland) Regulations 2012 (PPC 2012)[5]. Under Section 2 of the European Union

[1] UK Government (1999). Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended). Available online: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed May 2023).

[2] The European Commission (2000). *Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy*. As amended by Directives 2008/105/EC and 2013/39/EU and 2014/101/EU. Available online: https://eur-lex.europa.eu/resource.html?uri=cellar:5c835afb-2ec6-4577-bdf8-756d3d694eeb.0004.02/DOC_1&format=PDF (Accessed 16 November 2023)

[3] European Commission (2006). *Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration*. Available online: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32006L0118 (Accessed 16 November 2023).

[4] UK Government (2003). *Water Environment and Water Services (Scotland) Act 2003*, Available online: http://www.legislation.gov.uk/asp/2003/3/contents (Accessed 16 November 2023).

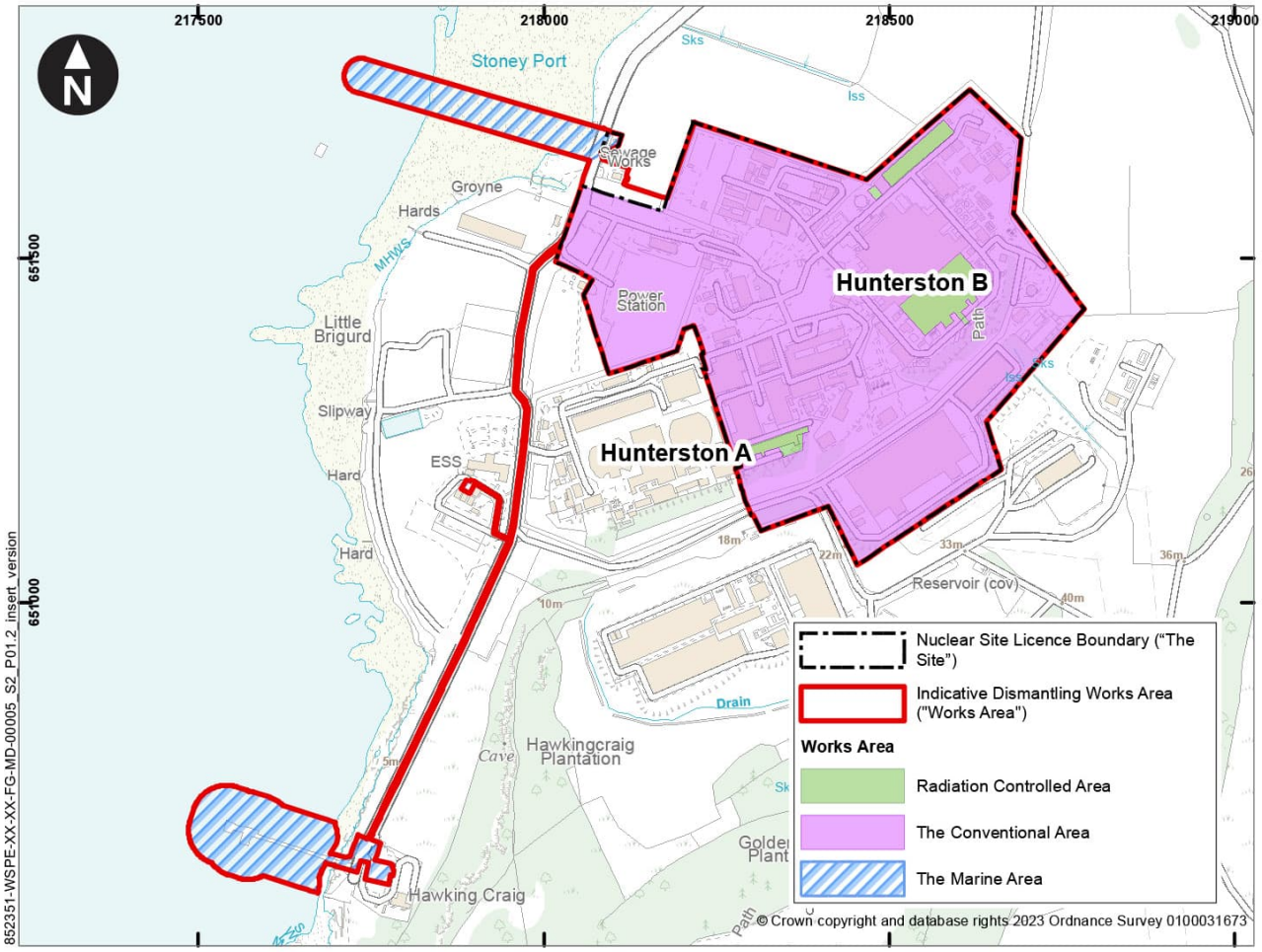
[5] UK Government (2012). *The Pollution Prevention and Control (Scotland) Regulations 2012* (online). Available at: The Pollution Prevention and Control (Scotland) Regulations 2012 (legislation.gov.uk) (Accessed 16 November 2023).

(Withdrawal) Act 2018[6], these continue to have effect in domestic law following the UK's withdrawal from the European Union.

1.1.4 WSP (UK), has been commissioned by EDF to undertake a Water Framework Directive (WFD) assessment to support the application for consent to decommission HNB.

1.1.5 The purpose of this WFD assessment is to evaluate the potential impacts of the dismantling works and the decommissioning process (referred to as the Proposed Works) may have on current or potential future WFD compliance. This includes consideration of the engineering works involved in decommissioning and changes to water discharge activities at the Site. To assist the identification of where works will be undertaken, an Indicative Dismantling Works Area (hereafter referred to as the 'Works Area') has been identified (see **Graphic 1.1**).

Graphic 1.1 - Hunterston B Decomissioning Works Area



[6] UK Government (2017) *European Union (Withdrawal) Act 2018*. Available online: https://www.legislation.gov.uk/ukpga/2018/16/contents/enacted [Accessed 16 November 2023]

1.2 Study Area

1.2.1 HNB lies on the west coast of Scotland on the Firth of Clyde, opposite the islands of Great and Little Cumbrae. It is approximately 7 km south/south-west of the seaside town of Largs, approximately 3.5 km to the south-west of West Kilbride and lies within the jurisdiction of North Ayrshire Council (NAC).

1.2.2 The Study Area for the WFD assessment includes any WFD water bodies with potential connectivity to the Works Area, along with the WFD water bodies which the Proposed Works potentially impact directly.

1.2.3 There are no reportable inland surface water bodies within the Study Area. In addition, there is no potential interaction of the Proposed Works with the freshwater environment beyond the Site boundary, which lies outside areas at risk of fluvial flooding, separate from watercourses, river WFD water bodies and onshore statutory designated sites.

1.2.4 The Site is adjacent to the Firth of Clyde on its western flank. Surface water from the Site finds its way to the coast to the west and north via outfalls, drains or ditches.

1.2.5 There are several drainage ditches in the fields to the north and south of the Site, the nearest is approximately 110 m to the north and runs for around 310 m west before it discharges to the Firth of Clyde through an outfall structure at Stoney Port.

1.2.6 The majority of surface water runoff from the Site is managed within an internal surface water drainage system which discharges to sea. Therefore, there is very limited hydrological connection between Site drainage systems and surrounding watercourses.

1.2.7 A summary of coastal surface water bodies and groundwater bodies within the Study Area is detailed within **Table 1.1**.

Table 1.1 – Water bodies which the Proposed Works could potentially impact

Water Body Name	Water Body Code	Water Body Type	Artificial or Heavily Modified Water Body	Water Body Description/Details
Largs Channel (Fairlie Roads)	200026	Coastal surface water	No	The Largs Channel (Fairlie Roads) Coastal Water Body lies within the Clyde sub basin district and Scotland River Basin District. The Largs Channel (Fairlie Roads) Coastal Water Body is hydrologically connected to the Seamill and Ardrossan Coastal Water Body, approximately 1.8 km to the south-west of the Works Area.
Seamill and Ardrossan	200024	Coastal surface water	No	The Seamill and Ardrossan Coastal Water Body lies within the Clyde sub basin district and Scotland River Basin District. The Seamill and Ardrossan Coastal Water Body is hydrologically connected to the Largs Channel (Fairlie Roads) Coastal Water Body, approximately 1.8 km to the south-west of the Works Area.

Water Body Name	Water Body Code	Water Body Type	Artificial or Heavily Modified Water Body	Water Body Description/Details
North Ayrshire Coastal	150785	Ground-water	Not applicable	The North Ayrshire Coastal Groundwater Body lies within the Clyde sub basin district and Scotland River Basin District. It is a drinking water protection zone.

1.3 The Proposed Works

Phases

1.3.1 The Proposed Works comprise the decommissioning of HNB and will include the dismantling and deconstruction of buildings and structures in areas within and outside the NSL boundary that are associated with energy generation. The Proposed Works will be carried out in three phases:

- Preparation for Quiescence
- Quiescence; and
- Final Site Clearance.

1.3.2 The Proposed Works comprise the following engineering activities, which may have potential impacts upon the WFD water bodies and quality elements:

- demolition of the cooling water (CW) intake head and the associated jetty to the south of HNB;
- plugging of the HNB long sea outfall head and installation of the Active Effluent Discharge Line (AEDL) discharging at the same location;
- demolition of existing buildings and the undertaking of groundworks on site, including the construction of the Safestore and waste facilities during the Preparations for Quiescence phase, and subsequent removal during different stages of the Proposed Works;
  - construction of new buildings and retention of existing hardstanding areas;
  - excavation works and void infilling activities;
  - final Site clearance works to make the Site available for future use.

1.3.3 As cessation of operation of HNB or defueling of the reactor do not form part of the decommissioning process, in accordance with the definition of decommissioning and requirements for assessment under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (EIADR)[7] (as amended), cessation of discharges of cooling water and operational trade effluents do not form part of the decommissioning process. However, any changes to water discharges arising from the decommissioning process are considered.

1.3.4 A summary of these works is provided below, and further details of the decommissioning process are described in Chapter 2 of the Environmental Statement (ES).

Preparations for Quiescence phase

1.3.5 The purpose of this phase is to reduce the hazards presented by the radioactive and non-radioactive materials and wastes on site and to place the Site into a passively safe and secure state for the Quiescence phase, where the need for human intervention to maintain acceptable condition is minimised.

1.3.6 This phase will include demolition of all existing buildings to ground level, except for the Reactor Building which will repurposed to create a 'Safestore' to allow further radioactive decay to occur during the Quiescence phase. It also includes the processing, packaging and removal of operational Intermediate Level Waste (ILW) and decommissioning Low Level Waste on site. It is assumed, subject to regulatory approval, that ILW requiring long term storage will be stored in the interim in the Hunterston A (HNA) Nuclear Power Station ILW Store until a Near Surface Facility in line with Scottish Government Policy becomes available to accept waste.

1.3.7 The new AEDL will be installed from the Seal Pit to the Outfall in the Firth of Clyde by placing a new pipe within the existing CW Outlet Tunnel prior to decommissioning the CW system.

1.3.8 The CW intake and outlet land shafts will be plugged on the seaward side of the structures within the tunnels. Following this the CW intake head will be demolished, followed by the associated jetty.

Quiescence phase

1.3.9 Following the preparations for quiescence phase, it is estimated that the Site will remain in a quiescent state for approximately 70 years. This is to allow for further decay of radioactive plant and materials housed in the Safestore prior to Final Site Clearance to reduce the quantity and radioactivity of radioactive waste when undertaking site clearance activities.

Final Site Clearance

1.3.10 This phase will involve removal of the Safestore from the Site, including all radioactive or other hazardous materials and wastes, for the purpose of de-licensing the Site.

[7] UK Government (1999). *The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations, 1999, as amended*. (Online) Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed 16 November 2023).

1.4 Purpose of the WFD

1.4.1 The primary aim of the WFD is to improve/maintain the Ecological Status/Potential of all surface water bodies and good qualitative and quantitative status of groundwater bodies and to prevent deterioration in status of the water bodies and their associated WFD quality elements. Ecological Status/Potential for surface waters is determined by a suite of biological, physico-chemical and hydromorphological quality elements. Chemical status is also assessed. The objectives of this WFD assessment are to:

- establish the baseline conditions;
- evaluate potential impacts of the Proposed Works on relevant water bodies; and
- assess the likely effects on compliance with WFD objectives.

1.4.2 The overarching objective of the WFD is for surface water bodies in Europe to attain overall 'Good Ecological Status' (GES) or 'Good Ecological Potential' (GEP) and good chemical status, while for groundwater bodies the objective is to reach good quantitative and chemical status. GES refers to situations where the ecological characteristics show only a slight deviation from natural/near natural conditions. In such a situation, the biological, chemical, physico-chemical and hydromorphological conditions are associated with limited or no human pressure. Artificial and heavily modified water bodies that cannot reach GES by virtue of their use have a target to achieve GEP, which recognises their important uses, whilst ensuring the quality elements are protected as far as possible.

1.4.3 The WFD sets a number of objectives including:

- to prevent deterioration in status for water bodies;
- to aim to achieve Good biological and Good surface water chemical status in water bodies. Those water bodies that did not achieve GES by 2015 need to achieve compliance by 2021 or 2027;
- for water bodies that are designated as artificial or heavily modified (A/HMWB), the objective is to achieve GEP. Those A/HMWB that did not achieve GEP by 2015 need to achieve compliance by 2021 or 2027;
- where it is considered either technically infeasible or disproportionately expensive to achieve GES or GEP by 2021 or 2027, alternative objectives have been set for the water body, such as a target to achieve Moderate status;
- comply with additional objectives and standards for protected areas where relevant; and
- progressively to reduce pollution from priority substances and cease discharges, emissions and losses of priority hazardous substances.

1.4.4 The introduction of a new modification, change in activity or change to structure in a water body needs to be considered in relation to whether it could cause deterioration in the Ecological Status or Potential of any water body.

1.4.5 New modifications or changes to activities or structures may also result in any proposed mitigation measures or actions to achieve GES/GEP being ineffective. This could result in the water body failing to meet GES/GEP. Where a development is considered to cause deterioration or where it may contribute to the failure of the water body to meet GES/GEP, then an Article 4.7 assessment would be required which makes provision for deterioration of status provided that certain conditions are met.

2. Methodology

2.1 Data collection

Desk study

2.1.1 A desk-based study was carried out to collect baseline information and inform the WFD assessment. The following data sources were used for the desk study:

- geology and soil maps (British Geological Survey, 2023);
- WFD status and objectives from Water Environment Hub (Scottish Environmental Protection Agency, 2023)[8] and Water Bodies Data Sheets (SEPA, 2023)[9]
- hydrological data (UKCEH, 2023);
- Nature Scot for designated sites[10]
- Marine Scotland – National Marine Plan Interactive Map[11];
- Sea Watch Foundation sightings[12];
- Hebridean Whale and Dolphin Trust[13]; and
- literature review and public data relevant to the Firth of Clyde.

Field survey

2.1.2 A site walkover was carried out on 7th October 2021 to characterise the baseline surface water environment within the Works Area and Study Area. Walkovers were conducted in the area immediately south-west of the Site to identify potential sources of surface water run-on from the terrain which slopes up towards Goldenberry Hill.

2.1.3 Site specific quarterly marine water quality surveys were undertaken during 2021 and 2022, with water samples collected from the seaward end of the HNB jetty, at location coordinates (NGR NS175506).

[8] Scottish Environmental Protection Agency (2023). Data Visualisation Water Environment Hub (Online). Available at: Water Environment Hub (sepa.org.uk) (Accessed 13 October 2023).

[9] Scottish Environmental Protection Agency (2023). Water Body Data Sheets (Online). Available at: Water Bodies Data Sheets (sepa.org.uk) (Accessed 13 October 2023).

[10] Nature Scot (2023). SiteLink (Online). Available at: SiteLink (nature.scot) (Accessed 13 October 2023).

[11] Marine Scotland (2023). Marine Scotland Maps National Marine Plan interactive (Online). Available at: https://marinescotland.atkinsgeospatial.com/nmpi/ (Accessed 28/03/2023).

[12] Sea Watch Foundation (2021) (online). Available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2022/01/NWDW-2021-Report_FINAL-2.pdf (Accessed 28/03/2023).

[13] Hebridean Whale and Dolphin Trust (2023) Sightings Map. (online) Available at: https://whaletrack.hwdt.org/sightings-map/ (Accessed 04 April 2023).

Hydromorphology walkover survey

2.1.4 The hydromorphology survey and assessment was undertaken in accordance with the CEN/ISO Water quality guidance standard on assessing the hydromorphological features of transitional and coastal waters (BS EN 16503:2014)[14] and Water quality guidance standard on determining the degree of modification of the hydromorphological features of transitional and coastal waters (BS EN 17123:2018)[15]. This is a requirement under Annex V of the WFD legislation.

Aquatic ecology surveys

2.1.5 Site specific surveys were undertaken in August 2020 for the intertidal zone, and in April, June, and July 2021 for the subtidal benthic environment[20]. An additional validation survey of the intertidal zone was undertaken in October 2022 to ensure that the scope of the survey completed in August 2020 was adequate. The intertidal survey covered a continuous swathe along the seafront of the Works Area.

2.1.6 The subtidal benthic surveys included bathymetry, sidescan sonar, drop-down video, subtidal grab sampling, and habitat mapping. The surveys covered two 400m x 400m areas to include the HNB power station cooling water intake and discharge locations.

Scottish Environment Protection Agency Records

2.1.7 Water quality data was downloaded from the Water Classification Hub (SEPA, 2020).

2.2 Consultation

2.2.1 A workshop with SEPA was held on 26th October 2023. SEPA raised concerns regarding the potential for groundwater pollution and contamination of surface water drainage discharges to the Firth of Clyde during excavations on the Site. Their concerns are addressed in **Chapter 11: Surface Water and Flood Risk** and **Chapter 12: Soils, Geology and Hydrogeology** of the ES.

2.3 WFD assessment process

2.3.1 The WFD assessment process for each water body is tailored, based on the type of water body assessed. Both coastal and groundwater bodies are considered in this assessment.

2.3.2 The assessment methodology used here is based on the guidance provided by the Planning Inspectorate Advice Note 18: The Water Framework Directive[16]. This guidance

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[14] Available at: https://shop.bsigroup.com/products/water-quality-guidance-standard-on-assessing-the-hydromorphological-features-of-transitional-and-coastal-waters?_ga=2.2586485.491621934.1638443489-2014026221.1595855911&_gac=1.208257318.1638443615.EAIaIQobChMI9I2Q8v3E9AIVmOd3Ch1OGAXcEAAYASABEgL49fD_BwE

[15] Available at: https://shop.bsigroup.com/products/water-quality-guidance-on-determining-the-degree-of-modification-of-the-hydromorphological-features-of-transitional-and-coastal-waters?_ga=2.1527924.491621934.1638443489-2014026221.1595855911&_gac=1.204596644.1638443615.EAIaIQobChMI9I2Q8v3E9AIVmOd3Ch1OGAXcEAAYASABEgL49fD_BwE

[16] HM Government (2017). *The Planning Inspectorate Guidance Note 18: Water Framework Directive*. Available online: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-18/ [Accessed May 2023]

outlines a three-stage process to WFD assessment: screening, scoping, and impact assessment. The outcome of each stage determines whether the assessment needs to progress to the next stage.

2.3.3 Whilst it is acknowledged that Advice Note 18 applies to Development Consent Order applications in England and Wales, and is not specific to Scotland, the guidance is considered appropriate as it provides a structured, consistent approach to undertaking WFD assessments.

Stage 1: Screening

2.3.4 Screening is required to identify activities which have the potential to result in deterioration of a water body or failure to comply with the objectives of that water body. Screening also serves to identify those proposed activities (e.g., proposed decommissioning methods) that are required to be taken through to scoping and those activities that are unlikely to result in the deterioration of the water body.

Stage 2: Scoping

2.3.5 Scoping is required to identify risks to receptors from a project's activities, based on the relevant water bodies and their water quality elements (including information on status, objectives, and the parameters for each water body). Potential risks to hydromorphology, biology, water quality, WFD protected areas and invasive non-native species should be assessed. The scoping stage identifies which elements need to be carried forward to Stage 3.

Stage 3: Impact Assessment

2.3.6 If the assessment progresses to Stage 3, a further assessment is undertaken to review environmental measures set to protect the water body and an assessment of the proposed activities against WFD status objectives.

2.3.7 Low risk activities may be screened out and not progressed to the scoping stage. During scoping, a more detailed assessment is undertaken, examining the risks to each potential receptor, which are associated with the WFD quality elements. The key receptors for assessment are:

- hydromorphology – morphological conditions, depth variation, structure and substrate of the coastal bed, structure of the intertidal zone, current direction, wave exposure;
- biological elements – phytoplankton, other aquatic flora, benthic invertebrate fauna;
- chemical and physico-chemical - transparency, thermal conditions, oxygenation, salinity, nutrients;
- chemical pollutants;
- invasive non-native species (INNS) are not specifically mentioned in WFD but may constitute an anthropogenic pressure that prevents attainment of the required status for particular quality elements; and
- quantitative and qualitative elements for groundwater water bodies.

2.3.8 Engineering works may have potential detrimental impacts on the WFD quality elements and may sometimes be of long duration. Such impacts are considered, along with

embedded environmental measures designed to reduce or eliminate potential impacts on the water body and WFD quality elements.

Hydromorphology

2.3.9 Hydromorphology is a set of physical characteristics which support biological elements. Where the hydromorphology of a surface water body is artificial or has been significantly altered for anthropogenic purposes (e.g. navigation or flood defence), such that it cannot meet GES, it can be designated as an Artificial or Heavily Modified Water Body ('A/HMWB'). An alternative environmental objective, good ecological potential ('GEP') applies in these cases.

Structure and substrate of the coastal seabed and intertidal zone

2.3.10 An assessment should be undertaken where the footprint of the activity is:

- 0.5 km² or larger;
- 1% or more of the water body's area;
- within 500 m of any higher sensitivity habitat; or
- 1% or more of any lower sensitivity habitat.

2.3.11 As per Environment Agency (2023) guidance[17], benthic habitats are divided into higher sensitivity and lower sensitivity habitats and are listed in **Table 2.1.**

Table 2.1 – Habitat sensitivity as defined by WFD guidance (Environment Agency, 2017)

Higher Sensitivity	Lower Sensitivity
Chalk reef	Cobbles, gravel and shingle
Clam, cockle and oyster beds	Intertidal soft sediments like sand and mud
Intertidal seagrass	Rocky shore
Maerl	Subtidal boulder fields
Mussel beds, including blue and horse mussel	Subtidal rocky reef
Polychaete reef	Subtidal soft sediments
Saltmarsh	
Subtidal kelp beds	
Subtidal seagrass	

[17] Environment Agency (2023) *Water Framework Directive assessment: estuarine and coastal waters*. Available online: https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters [Accessed 29 November 2023]

Biology – Fish

2.3.12 Fish species should be considered if activities:

- are in an estuary designated as a transitional water body;
- are in a coastal water body outside an estuary but could delay or prevent fish from entering an estuary; or
- could affect fish migration through an estuary to freshwater.

Water Quality

2.3.13 Water quality encompasses the chemical status of the water body in relation to hazardous substances but also physico-chemical elements that support the biology, such as clarity, temperature, salinity, oxygen levels, nutrients and specific pollutants. Water quality should be considered as a receptor if activities:

- could affect water clarity, temperature, salinity, oxygen levels, nutrients or specific pollutants continuously for longer than a spring neap tidal cycle (about 14 days);
- are in a water body with a phytoplankton status of moderate, poor or bad; or
- are in a water body with a history of harmful algae.

WFD Protected Areas

2.3.14 WFD protected areas encompass sites protected under the National Site Network (formerly Natura 2000) (i.e. Special Areas of Conservation ('SACs') and Special Protection Areas ('SPAs')), bathing waters, shellfish waters and nutrient sensitive areas ('NSAs'). Guidance stipulates that WFD protected areas located within 2 km of the proposed activity must be identified (Environment Agency, 2017). It also acknowledges that the footprint of effects of an activity may be extended because of temperature or sediment plume, and for dredging activity (not applicable within this assessment), the footprint is taken as 1.5 times the dredge area. For this assessment the tidal ellipse is ~4km long and 0.5km wide, and the tide is parallel to the coasts. Therefore, coastal water bodies beyond the Cumbrae islands are outside the Study Area.

Invasive Non-Native Species

2.3.15 The introduction and spread of INNS can occur directly through the release of individuals of INNS species into the environment via activities, e.g. through release of ballast water[18] or on the hull of ships even if recently cleaned or anti-fouled[19],[20] or indirectly by creating opportunities for organisms to settle or spread (e.g. habitat creation or disturbance), thereby allowing for them to out-compete native species. Therefore, activities should be considered where:

- materials or equipment have come from, have been used in or travelled through other water bodies; or
- activities are involved that help spread existing INNS, either within the immediate water body or to other water bodies.

2.3.16 INNS are not specifically mentioned in WFD but may constitute an anthropogenic pressure that prevents attainment of the required status for particular biological quality elements.

Measures to Achieve Environmental Objectives

2.3.17 For the Scotland River Basin District, a programme of measures has been drawn up to enable the achievement of objectives of the RBMP[21]. These include:

- current measures;
- measures to enable improvements by 2027; and
- additional measures identified to achieve objectives beyond 2027.

2.3.18 These are integrated with measures for protected areas via site specific action plans. Current measures in the Scotland RBMP include:

- rural land management practices to reduce diffuse pollution;
- improving quality of data available on the amount of water that is used across industry;
  - for public water supply; and
  - to generate hydropower.
- assessment of the physical condition of Scotland's water environment to understand the extent and impacts of modifications and structures, such as embankments; culverts; and the widening and straightening of rivers.
- removal or easing of barriers to fish migration, through evaluation of structures such as weirs, culverts and bridges.

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[18] Ware, R., Yguel, B. and Majerus, M. (2009) *Effects of competition, cannibalism, and intra-guild predation on larval development of the European coccinellid* Adalia bipunctata *and the invasive species* Harmonia axyridis. *Ecological Entomology* **34**:12-19.

[19] International Maritime Organisation (2012). *Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species*, 2012 Edition.

[20] Davidson, I. C., Zabin, C. J., Chang, A. L., Brown, C. W., Sytsma, M. D. and Ruiz, G. M. (2010). Recreational boats as potential vectors of marine organisms at an invasion hotspot. *Aquatic Biology* **11**:179-191.

[21] Scottish Environment Protection Agency (2021) *The River Basin Management Plan for Scotland 2021-2027*. Available online: https://www.sepa.org.uk/media/594088/211222-final-rbmp3-scotland.pdf (Accessed 14 November 2023).

2.3.19 These are managed through the application of relevant legislation, policy and guidance by regulators and operators, as well as future planning, joint planning and coordination between regulators and operators. Additional measures include improved flood resilience, climate change adaptation, increased biodiversity and social cohesion.

2.4 Limitations and assumptions

2.4.1 There are limitations related the acquisition of baseline data for the biological quality assessment. The acquisition of acoustic data around the existing cooling water discharge was impeded by high reflectivity artefacts due to the high degree of turbulence and aeration of the water column.

2.4.2 There is no recent data on sediment quality available to assess potential contamination. However, there is limited scope for sediment remobilisation and secondary impacts to biota.

3. Baseline

3.1 Catchment characteristics

Catchment geology and soils

3.1.1 A detailed description of the geology and soils baseline is presented in **Chapter 12: Soils, Geology and Hydrogeology** of the ES.

Catchment hydrology

3.1.2 A detailed description of inland surface waters baseline is presented in **Chapter 11: Surface Water and Flood Risk** and the groundwater baseline is considered in **Chapter 12: Soils, Geology and Hydrogeology** of the ES.

Coastal Management and Marine Water Quality

3.1.3 A detailed description of coastal management and marine water quality is presented in **Chapter 10: Coastal Management and Water Quality** of the ES.

3.2 Baseline characteristics against WFD quality elements for relevant surface waters

3.2.1 A summary of the WFD status of the Largs Channel (Fairlie Road) Coastal water body (ID: 200026) is provided in **Table 3.1**.

Table 3.1 - WFD status of the Largs Channel (Fairlie Roads) Coastal water body (ID: 200026) (source SEPA)

Largs Channel (Fairlie Roads) coastal surface water body	**ID: 200026**
Water body type	Coastal
River Basin District	Scotland
Water body area	29.87km2
Hydromorphological designation	Good
Overall ecological status/potential	Good
Current overall status/potential	Good
Status objective (overall)	Good
Higher sensitivity habitats present	Native Oysters, Kelp beds, Seagrass beds.
Lower sensitivity habitats present	Not assessed

Largs Channel (Fairlie Roads) coastal surface water body	ID: 200026
History of harmful algae	Not assessed
Protected Area Designation	Largs (Largs Channel) Water contact activity - RECREATIONAL WATER Millport Bay - EC BATHING WATER Fairlie - SHELLFISH WATER Largs Pencil - EC BATHING WATER
Biological Quality Elements	
Overall biological quality element status objective	Good
Angiosperms	N/A
Fish	N/A
Invertebrates	Good
Macro-algae	Good
Phytoplankton	High
Physico-chemical Quality Elements	
Overall physico-chemical quality element status objective	High
Dissolved inorganic nitrogen	High
Dissolved oxygen	High
Specific pollutants	Pass
Arsenic	Pass
Copper	Pass
Zinc	Pass
Priority substances	Pass
Other pollutants	Not assessed
Priority hazardous substances	Not assessed
Overall chemical status	Pass
Overall chemical quality element status objective	Pass
Hydromorphological Quality Elements	
Supporting elements (Surface Water)	Not assessed
Mitigation measures assessment	Not assessed

3.2.2 A summary of the WFD status of the Seamill and Ardrossan Coastal water body (ID: 200024) is provided in **Table 3.2**.

Table 3.2 - WFD status of the Seamill and Ardrossan Coastal water body (ID: 200024) (source SEPA)

Seamill and Ardrossan water body	**ID: 200024**
Water body type	Coastal
River Basin District	Scotland
Water body area	98.00km^2
Hydromorphological designation	High
Reason for not achieving good status	Point source discharges of wastewater (sewage) disposal.
For what use is the water body designated heavily modified?	N/A
Overall ecological status/potential	Moderate
Current overall status/potential	Moderate
Status objective (overall)	Good
Justification for not achieving Good Status by 2014 (from SEPA Water Environment Hub)	Point source discharges of wastewater (sewage) disposal. The improvements required could not reasonably be made by 22/12/2021 for reasons of technical feasibility. 2014 assessments indicated that the condition of bottom living, invertebrate animal communities in the water body may not be good. However, they have not yet been able to identify the cause.
Higher sensitivity habitats present	Native Oysters, Subtidal Kelp beds
Lower sensitivity habitats present	Unknown
History of harmful algae	Not Assessed
Protected Area Designation	N/A
Biological Quality Elements	
Overall biological quality element status objective	Good
Angiosperms	Not Assessed
Fish	Not Assessed
Invertebrates	Good
Macro-algae	Good

Seamill and Ardrossan water body	ID: 200024
Phytoplankton	High
Physico-chemical Quality Elements	
Overall physico-chemical quality element status objective	High
Dissolved inorganic nitrogen	High
Dissolved oxygen	High
Specific pollutants	Pass
Arsenic	Pass
Copper	Pass
Zinc	Pass
Priority substances	Pass
Other pollutants	Not Assessed
Priority hazardous substances	Not Assessed
Overall chemical status	Pass
Overall chemical quality element status objective	Pass
Hydromorphological Quality Elements	
Supporting elements (Surface Water)	Not Assessed
Mitigation measures assessment	Not Assessed

Hydromorphology quality elements for coastal surface water bodies

3.2.3 Hydromorphology in the Largs Channel (Fairlie Road) and Seamill and Ardrossan water bodies are currently assessed as Good and High, respectively. Activities where the footprint of the activity exceeds the criteria listed in paragraph 2.3.10 may have potential to cause changes in the quality elements described below.

Tidal Regime

3.2.4 The length of the spring tidal ellipse off Hunterston, based on data from tidal diamond B on UK Admiralty chart 1867, located between Hunterston and Little Cumbrae, is a narrow ellipse extending up to approximately 4 km in each direction from the Site along a north-north-east to south-south-west axis, with the principal tidal currents running parallel to the shore. The tidal ellipse is narrow, extending less than 0.5 km in a west-north-west to east-south-east direction.

Depth variation

3.2.5 Fairlie roads is a deep-water channel in the Firth of Clyde adjacent to the Site, between HNB and the Cumbrae Islands. From the shoreline adjacent to the Works Area, the seabed slopes to a maximum depth of 50m. A shipping channel passes through this known as the Hunterston Channel. The Largs Channel (Fairlie Road) water body occupies this area between HNB and the Cumbrae Islands.

Quality, structure and substrate of the bed

3.2.6 According to the British Geological Survey (2023)[22,23], the area adjacent to the Site in the Largs Channel is marked by Superficial deposits of Marine Beach Deposits (sand and gravel), whilst marine seabed sediments in the Largs Channel are characterised by sandy mud (holocene, undifferentiated). The bedrock geology of the Largs Channel adjacent to the Site is defined by the BGS as upper Devonian rocks, made up of sandstone, conglomerate, siltstone and mudstone. The Western section of the channel comprises basalt, lava and sandstone bedrock, as well as an unnamed igneous intrusion of unknown age surrounding the Little Cumbrae Island.

Structure of the intertidal zone

3.2.7 The shoreline adjacent to the Works Area is predominantly composed of hard or artificial material, with less than 15% described as soft. Sediment drift in this area is in a northerly direction, with a sediment sink at Hunterston Sands. South of the Works Area is characterised by a raised rock platform that is backed by a steep raised relict cliff line. This relict line can be traced from Portencross to Hunterston in the north. At Hunterston, the occurrence of soft sediment within the intertidal zone increases to form an area of tidal sandflats.

Freshwater zone

3.2.8 The Clyde Estuary to the north of the Site provide inputs of freshwater into the Largs Channel. Across monitored parameters, marine water quality is within the range for a lower estuary site when placed within the local context, noting, for example, that salinity data show the influence of freshwater inputs (salinity in the open sea being typically 34 salinity units around the UK, with electrical conductivity of seawater typically around 50 mS/cm).

Wave exposure

3.2.9 The topography of the area means that the principal exposure to strong winds and thus the largest waves is from the south-west, thus involving a significant longshore component at HNB. The shoreline at Hawking Craig is very exposed, and force 8 gales can typically produce maximum significant wave heights of 1 m to 1.5 m.

[22] BGS (2023). *GeoIndex Offshore*. Available online: GeoIndex Offshore | BGS (Accessed 14 November 2023).

[23] BGS (2023). *GeoIndex Onshore*. Available online: GeoIndex - British Geological Survey (bgs.ac.uk) (Accessed 14 November 2023).

Biological Quality Elements for coastal surface water bodies

Composition abundance and biomass of phytoplankton

3.2.3 The phytoplankton quality element for coastal waters is assessed using the Coastal Water Phytoplankton Tool[24]. This considers three separate indices covering:

- phytoplankton biomass (based on chlorophyll measurement);
- number of occasions in a season when phytoplankton numbers exceed a defined threshold (number of 'blooms'); and
- seasonal ratios of diatoms and dinoflagellates.

3.2.4 The three indices are averaged to provide an overall phytoplankton assessment. The measured conditions (observed values) are compared against those described for reference conditions (minimally disturbed) to provide an Ecological Quality Ratio (EQR), whose values are used to indicate the status of the water body.

3.2.5 The phytoplankton quality element status is affected by nutrient concentrations in the coastal water, thus any activity involving discharge of or mobilisation of nutrients has the potential to affect the WFD status.

3.2.6 Phytoplankton in the Largs Channel (Fairlie Road) and Seamill and Ardrossan water bodies are both currently assessed as High.

3.2.7 No phytoplankton data were recorded during the surveys. However, Marine Scotland monitor plankton in Scottish coastal waters[25]. The highest number of diatoms in the water on the Scottish West Coast is observed in March. Since monitoring began there has been a change in the dominant species of the spring diatom bloom. The diatom genus *Chaetoceros* was observed to be more abundant in the 1990s, but more recently the diatom *Skeletonema* has been observed to be dominant.

Composition and abundance of other aquatic flora

Angiosperms

3.2.8 Whilst angiosperms are not used for WFD classification purposes in the Largs Channel (Fairlie Road) and Seamill and Ardrossan water bodies, dwarf eel grass (*Zostera noltii*), a higher sensitivity habitat, is known to be present close to the Proposed Works.

3.2.9 Whilst no dwarf eel grass was recorded during the intertidal validation survey, it has been recorded along the intertidal sediment flats at Southannan Sands SSSI, approximately 0.2 km to the north of the Works Area, within the Largs Channel (Fairlie Roads) coastal surface water body.

[24] UKTAG (2014) *UKTAG Coastal Water Assessment Method: Phytoplankton. Coastal Water Phytoplankton Tool*. Published by Water Framework Directive – United Kingdom Technical Advisory Group (WFD-UKTAG). April 2014

[25] Scottish Government (2023) *Scotland's Marine Atlas: Information for The National Marine Plan*. Available online: PLANKTON - Scotland's Marine Atlas: Information for The National Marine Plan - gov.scot (www.gov.scot) (Accessed 13 October 2023).

Macroalgae

3.2.10 The macroalgae quality element for coastal waters is assessed using the Intertidal Rocky Shore Macroalgal Index[26]. This considers five separate metrics covering:

- species richness (normalised using a shore factor);
- proportion of Chlorophyta (green) algal species;
- proportion of Rhodophyta (red) algal species;
- proportion of opportunists (fast-growing nuisance algae); and
- ratio of ecological status groups.

3.2.11 The five metrics are combined to form a multi-metric index to provide an overall macroalgae assessment. The measured conditions (observed values) are compared against those described for reference conditions (minimally disturbed) to provide an EQR, whose values are used to indicate the status of the water body.

3.2.12 The macroalgae quality element status is affected by nutrient concentrations in the coastal water, thus any activity involving discharge or mobilisation of nutrients has the potential to affect the WFD status.

3.2.13 Macroalgae data was recorded during the intertidal validation survey of the foreshore on 07 October 2022. Egg wrack (*Ascophyllum nodosum*), toothed wrack (*Fucus serratus*), spiral wrack (*Fucus spiralis*), bladder wrack (*Fucus vesiculosus*), channelled wrack (*Pelvetia canaliculata*), Rhodophyceae, Ulvaceae, *Ulva intestinalis, Ulva lactuca* were identified.

3.2.14 Macroalgae data was recorded during subtidal benthic sampling undertaken between April and July 2021, comprising acoustic surveys in April followed by drop-down camera and grab sampling in June and July. The benthic environment in the Study Area is generally characterised by dense macroalgal communities on soft sediments with occasional cobbles and boulders present. Kelps are the predominant species present, forming kelp beds. The species *Laminaria saccharina, Saccorhiza polyschides, Chorda filum*, *Saccharina latissima, Dictyosiphon foeniculaceus, Desmarestia aculeata, Halidrys siliquosa, Odonthalia dentata* and filamentous red algae were identified.

3.2.15 The INNS *Sargassum muticum* was recorded frequently in both survey areas.

Composition and abundance of benthic invertebrate fauna

3.2.16 The benthic invertebrate quality element for coastal waters is assessed using the infaunal quality index (IQI)[27]. This is a multimetric index for soft-bottom fauna composed of three individual components known as metrics, these are the:

- AZTI Marine Biotic Index (AMBI), a weighted average sensitivity score of all individuals within a sample;

[26] UKTAG (2014) *UKTAG Coastal Water Assessment Method: Macroalgae. Coastal Water Intertidal Rocky Shore Macroalgae Index*. Published by Water Framework Directive – United Kingdom Technical Advisory Group (WFD-UKTAG). April 2014

[27] UKTAG (2014) *UKTAG Transitional and Coastal Water Assessment Method: Benthic invertebrate fauna. Infaunal Quality Index*. Published by Water Framework Directive – United Kingdom Technical Advisory Group (WFD-UKTAG). April 2014.

- Simpson's Evenness, a measure of the distribution of individuals across the different distinct taxonomic groups within a sample; and
- number of taxonomic groups recorded.

3.2.17 The measured conditions (observed values) are compared against those described for reference conditions (minimally disturbed) to provide an EQR, whose values are used to indicate the status of the water body.

3.2.18 Thus, any activity with potential to affect the numbers of individuals of different species or the species composition of a benthic community has the potential to affect the IQI score and thus affect WFD compliance.

3.2.19 Benthic macroinvertebrates are currently assessed as being of good status within both the Largs Channel (Fairlie Roads) and Seamill and Ardrossan coastal water bodies.

3.2.20 Surveys were undertaken in the intertidal and subtidal benthic zones within the Works Area (see **Graphic 3.1** and **Graphic 3.2**). Subtidal benthic sampling was undertaken in April, June and July 2021 as part of the Hunterston B decommissioning project within the Largs Channel (Fairlie Road) water body. These subtidal benthic surveys included bathymetry, sidescan sonar, drop-down video, subtidal grab sampling, and habitat mapping and covered two main areas around the cooling water discharge and the cooling water intake.. Site-specific surveys were undertaken in August 2020 for the intertidal zone and an additional validation survey of the intertidal zone was undertaken in October 2022 to ensure that the scope of the survey completed in August 2020 remained adequate. The intertidal survey covered a continuous swathe along the seafront of the Works Area.

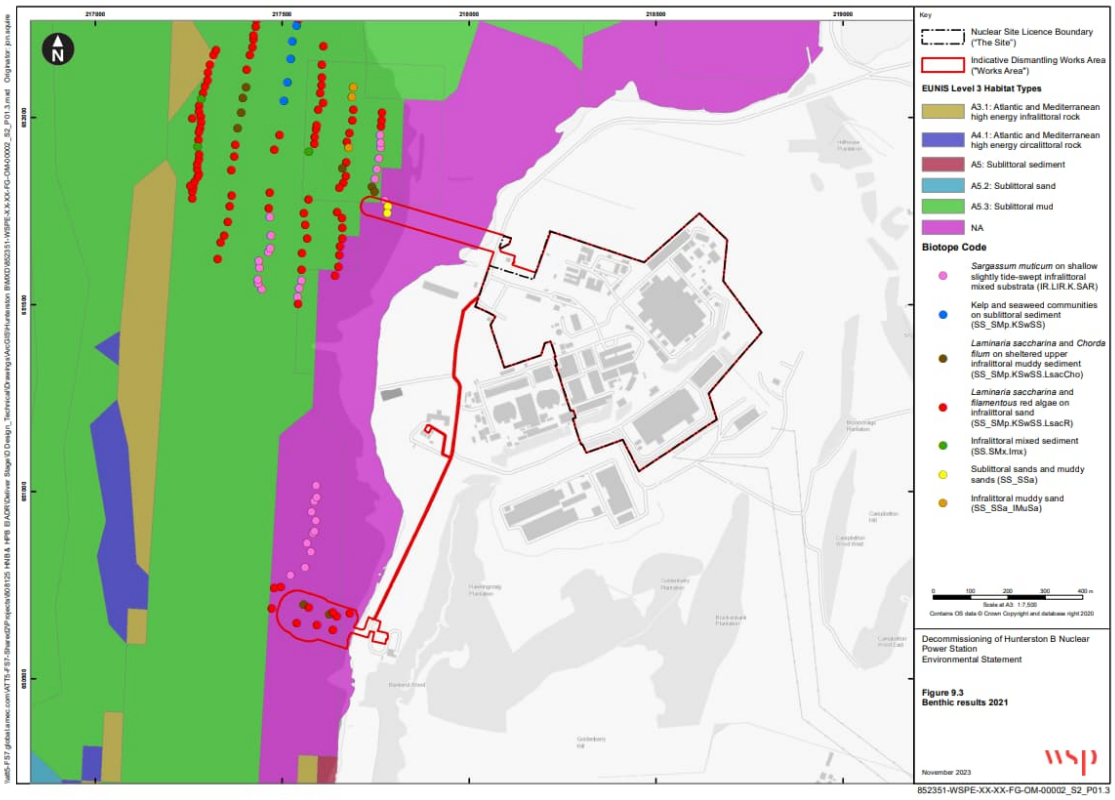
3.2.21 During the intertidal and subtidal surveys no benthic macroinvertebrate INNS, priority marine features or protected species were recorded as being present.

3.2.22 The intertidal and subtidal surveys demonstrated that the species diversity is generally high across all sampling locations and shows there is a large degree of variation across the survey area. The highest number of taxa was recorded from the intake area, compared to the outfall area. However, a lower diversity index is observed at the north of the cooling water intake in contrast with the high diversity at the south-west of the intake. Furthermore, although lower in the total number of individuals sampled, samples in the cooling water discharge area exhibit higher diversity.

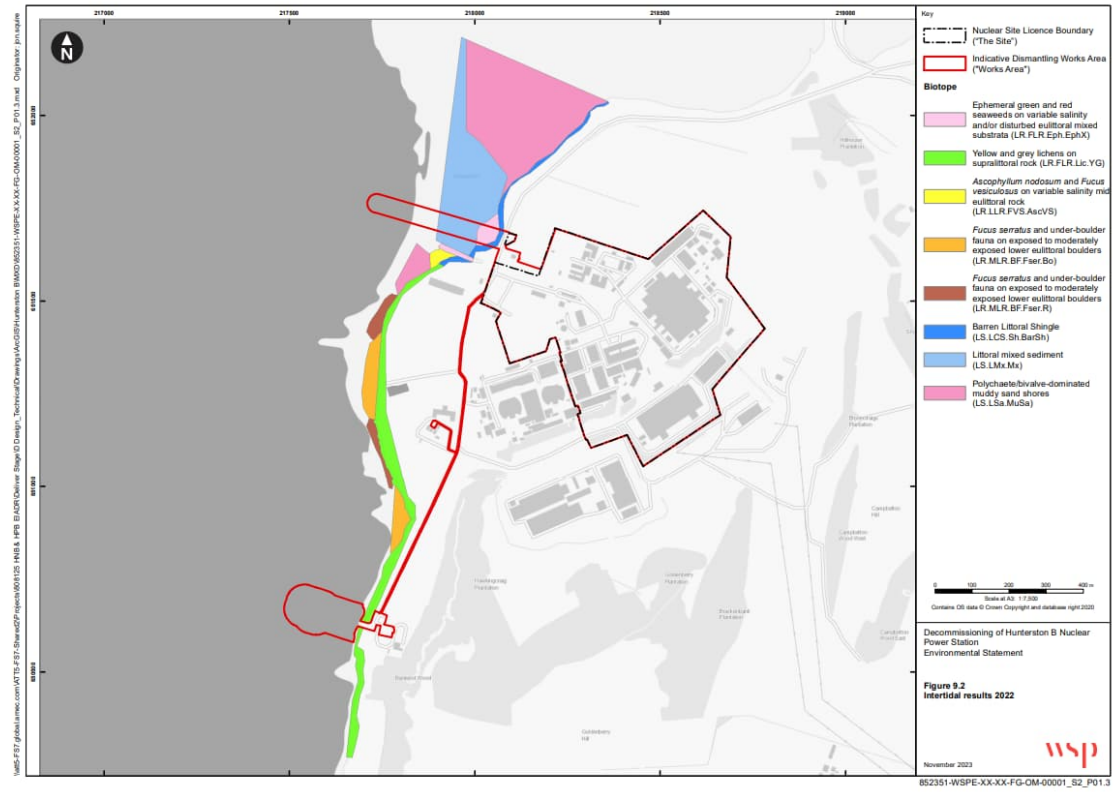
3.2.23 The benthic macroinvertebrate assemblage was dominated by Annelida (35.5% of individuals), Crustacea (29.9%), Nematoda (17.7%), Mollusca (1.1%). Platyhelminthes, Nemertea, Echinodermata, Phoronida, Actinaria, Pyconogonida, Ascidiacea, Chordata were all recorded in very small proportions. Other common taxa were *Thalestris longimana, Grania* spp*., Macomangulus tenuis, Kurtiella biedentata*, *Protodorvillea kefersteini, Mytilus tenuis, Streptosyllis websteri, Semibalanus balanoides, Patella vulgata, Littorina littorea, Littorina* spp*.*

3.2.24 During the surveys epifauna was found to be generally scarce. Encrusting bryozoans, short hydroid turf (*Obelia* sp.), small gastropods, serpulid worms, anemone *Cerianthus lloydi*, sea stars *Steria rubens* and *Marthasterias glacialis* were recorded.

Graphic 3.1 Benthic results (2021)



Graphic 3.2 Intertidal survey results (2022)



Biological quality elements applicable to transitional and river water bodies

Fish

3.2.25 The Largs Channel (Fairlie Road) and Seamill and Ardrossan coastal water bodies are not monitored for fish and fish are not a quality element used in assessing the status of coastal waters under the WFD. However, the area supports a diverse fish population and it was deemed useful to include some information regarding fish in the area.

3.2.26 Fish data from within the Firth of Clyde is described by Heith and Spiers (2011)[28], McIntyre *et al*., (2012)[29] and within Scotland's Marine Atlas[30]. 70 fish taxa have been recorded during survey trawls by Marine Scotland between 1927 and 2009, of which 59 were demersal species.

3.2.27 Several species recorded are listed on the Scottish Biodiversity List[31] (SBL), including skate, thornback ray, twaite shad, plaice, herring, and cod. Data collection by Marine Scotland ceased over ten years ago but it is thought that the data collated provides an indicative baseline of the general fish community in the region.

3.2.28 Basking Sharks are regularly recorded around the outer Firth of Clyde. The species is listed in the SBL and protected within the 12 nm limit off Scotland under the Wildlife and Countryside Act 1981[32] and is classified 'endangered' on the IUCN Red List[33]. Basking Sharks have been sighted once within Kames Bay (Great Cumbrae Island) in 2022-2023, by the Hebridean Whale and Dolphin Trust[34].

3.2.29 Six migratory species are known to frequent waters surrounding the Works Area. These species include Atlantic salmon *Salmo salar*, sea trout *Salmo trutta,* river lamprey *Lampetra fluviatilis*, sea lamprey *Petromyzon marinus*[35], twaite shad *Alosa fallax* and European eel *Anguilla anguilla*[36]. All are included within the SBL as being of principal importance for biodiversity conservation in Scotland.

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[28] Heath, M and Spiers, D (2011) Changes in species diversity and size composition in the Firth of Clyde demersal fish community (1927-2009). *Proceedings of the Royal Society*, **279**, 543-552.

[29] McIntyre, F., Fernandes, P.G. and W.R., Turrell (2012) *Scottish Marine and Freshwater Science*, **3**, 2043-7722.

[30] Marine Scotland (2011) *Scotland's Marine Atlas: Overall Assessment* [online]. Available online: https://marine.gov.scot/information/scotlands-marine-atlas-overall-assessment-2011 (Accessed 05 April 2023).

[31] NatureScot (2020). *Scottish Biodiversity List*. (Online) Available at: https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy-and-cop15/scottish-biodiversity-list (Accessed 05 April 2023).

[32] UK Government (1981). *Wildlife and Countryside Act 1981*. Available online: https://www.legislation.gov.uk/ukpga/1981/69 (Accessed 20 November 2023).

[33] IUCN (2022). *The IUCN Red List of Threatened Species*. Available online: https://www.iucnredlist.org/ (Accessed 16 May 2023).

[34] Hebridean Whale and Dolphin Trust 'Whale Track' records tracker. Available online: https://whaletrack.hwdt.org/all-records/. (Accessed 11 May 2023)

[35] O'Reilly, M., Nowacki S., and Elliott M., (2016). A Citizen Science approach to monitoring migratory lampreys under the Water Framework Directive, with some new accounts of Sea Lampreys (Petromyzon marinus) from south west Scotland. *The Glasgow Naturalist*, **26**, Part 2, 102-105.

[36] Jackson, F.L., Millidine, K.J., Glover, R.S., Fryer, R.J., Malcolm I.A. (2022) *NEPS Fish Species Presence/Absence 2018, 2019, 2021*. DOI: 10.7489/12404-1.

3.2.30 These migratory species feature in the classification of transitional waters using the UKTAG Transitional Fish Classification Index[37] and salmonids are included in the assessment of the fish quality element for rivers using the Fish Classification Scheme 2 (FCS2) Scotland[38]. Therefore, any activity in a coastal water that interfered with migration of these species to more inland transitional waters and rivers would have the potential to affect WFD compliance in these more inland water bodies. As the Clyde Estuary is a transitional water body and the Firth of Clyde (which includes the Largs Channel (Fairlie Roads) coastal surface water body), gives access from the sea to a transitional water body and river water bodies, migratory fish have therefore been included in this assessment.

Physico-Chemical Quality Elements and Water Quality

3.2.31 WFD targets in the form of Environmental Quality Standards (EQS are set out in *The Scotland River Basin District (Standards) Directions 2014*.

3.2.32 During the baseline data collation for the assessment of coastal water quality **in Chapter 10: Coastal Management and Water Quality** of the ES, four quarterly water sampling surveys were undertaken from the seaward end of the HNB jetty, over the period April 2021 to March 2022 to account for potential seasonal variations. Samples were collected at depths of 1 m, 2 m, and 3 m from the water surface.

Table 3.3 – Key Water Quality Parameters Recorded (Depth Averaged)

Parameter	Spring (Apr 2021)	Summer (Aug 2021)	Autumn (Nov 2021)	Winter (Mar 2022)	Annual Range
Average temperature (°C)	8.29	15.28	12.65	7.04	Max: 15.28 Min: 6.92
Average salinity (units)	25.40	26.77	26.08	24.79	Max: 26.77 Min: 24.52
Average electrical conductivity (mS/cm)	39.90	41.75	40.82	39.30	Max: 41.76 Min: 38.96
Average dissolved oxygen (mg/l)	10.94	8.90	8.65	11.82	Max: 11.95 Min: 8.50
Average total suspended solids (TSS) (mg/l)	44.73	33.53	35.33	26.06	Max: 49.70 Min: 24.3

[37] UKTAG (2014) *UKTAG Transitional Water Assessment Method: Fish Fauna. Transitional Fish Classification Index*. Published by Water Framework Directive – United Kingdom Technical Advisory Group (WFD-UKTAG). July 2014.

[38] UKTAG (2014) *UKTAG River Assessment Method: Fish Fauna. Fish Classification Scheme 2 (FCS2) Scotland*. Published by Water Framework Directive – United Kingdom Technical Advisory Group (WFD-UKTAG). September 2021.

3.2.33 All the parameters have been calculated as an average of 3 depth locations at the seaward end of the jetty. Annual range represents the range across the depth averaged mean values.

Specific Pollutants, Priority Substances and Priority Hazardous Substances

3.2.34 With the exception of three individual results for zinc and one for lead, concentrations of all metals recorded in samples taken throughout the quarterly surveys were below the reporting limit for the specific analysis at the time. Overall, the data indicate low levels of metals and do not suggest the presence of significant contamination in the water column.

Dissolved Inorganic Nitrogen

3.2.35 The nutrient results across the survey period were consistently low, at less than the reporting limits for both nitrate and ammoniacal nitrogen (and below the relevant EQS levels) in all cases. For a typical Firth of Clyde pH value of 7.9[39], temperature (depth averaged) of 7.04°C and salinity (depth averaged) of 24.79 units, application of the Environment Agency's calculation algorithm for saline waters shows that the reported total ammonia concentration of <0.2mg/l (as NH3 – equivalent to <0.165mg/l as N) corresponds to an un-ionised ammonia concentration of <0.0019mg/l, which is of no concern in relation to compliance with the EQS.

Dissolved Oxygen

3.2.36 Dissolved oxygen concentrations present variability between sampling at events at the end of the HNB jetty. Dissolved oxygen concentrations taken over the period April 2021 to March 2022, indicate that dissolved oxygen concentrations are highest in Winter and lowest in the Summer and Autumn months, shown in **Table 3.3**.

Turbidity

3.2.37 The Firth of the Clyde is known to have existing high turbidity levels, due to the freshwater input into to the coastal area. This is reflected in the measurements taken during the quarterly marine surveys, presented in **Table 3.3**.

Water Temperature

3.2.38 Water temperature exhibits seasonal variations in temperature at the quarterly sampling point, with the lowest temperature recorded in March 2022 (7.04°C) and the highest recorded in August 2021 (15.28°C).

Protected Areas

Statutory Sites

3.2.39 There are no SACs or SPAs within 2km of the Works Area.

[39] Muller F.L.L, Balls P.W. and Tranter M. (1995) Processes controlling chemical distributions in the Firth of Clyde (Scotland). *Oceanologica Acta*, **18(5)**, 493- 509.

3.2.40 Four designated sites were identified close to the Works Area, including three classified for bathing, and one for shellfish.

3.2.41 A summary of designated sites is provided in **Table 3.4**.

Table 3.4 - WFD Protected areas in Largs Channel (Fairlie Roads) Coastal Water Body

Site Name	Designation	Approximate distance and orientation from Works Area	Description
Millport Bay	EC BATHING WATER	3.5 km north-west	
Seamill	EC BATHING WATER	5 km south	
Largs Pencil	EC BATHING WATER	8 km north	Outside study area defined in **Chapter 10** of the ES
Fairlie	SHELLFISH WATER	3 km north	Common mussels, Pacific oysters, native oysters

WFD and Other Protected Area Features

3.2.42 Three habitats listed as Habitats of Principal Importance (HPIs) for Nature Conservation under the Natural Environment and Rural Communities Act[40] were identified within 500m of the Site. These habitats are seagrass beds, subtidal kelp beds and native oyster beds.

3.2.43 Protected areas reported in the SEPA Water Body data sheets within the Largs Channel (Fairlie Road) Coastal water body are:

- Millport Bay – EC Bathing Water;
- Largs Pencil – EC Bathing Water; and
- Fairlie – Shellfish Water.

3.2.44 Groundwater Protected Areas reported within the North Ayrshire water body are:

- North Ayrshire Coastal – Drinking Water Protection Zone

Invasive Non-Native Species

3.2.45 *Sargassum muticum* was identified during the benthic surveys, within both survey areas.

3.3 Baseline characteristics against WFD quality elements for groundwater bodies

3.3.1 Criteria for assessing chemical status of groundwater bodies are given in Schedule 6 to the *Scotland River Basin District (Standards) Directions 2014*:

[40] UK Government (2006). *Natural Environment and Rural Communities Act*. Available online: https://www.legislation.gov.uk/ukpga/2006/16/pdfs/ukpga_20060016_en.pdf] (Accessed 20 November 2023).

3.3.2 The baseline status for the North Ayrshire Coastal (ID: 150785) Groundwater Body is provided in **Table 3.5**. Both quantitative and chemical quality elements were assessed as good in 2020.

Table 3.5- WFD groundwater status of the North Ayrshire Coastal groundwater body (ID: 150785) (source SEPA)

North Ayrshire Coastal water body	ID: 150785
Water body type	Groundwater
Water body area	43.7km^2
Current Overall Status	Good
Reason for not Achieving Good status	N/A
Current Quantitative Status	Good
Current Chemical Status (GW)	Good
Protected Area Designation	North Ayrshire Coastal – DRINKING WATER PROTECTION ZONE
Quantitative Elements	
Saline intrusion	Good
Water balance	Good
Surface water interaction	Good
GWDTEs	Not assessed
Dependent surface water body	Not assessed
Chemical (GW) Elements	
Drinking water protected area	Good
General chemical test	Good
Priority substances	Good
Specific pollutants	Good
Other substances	Good
Saline intrusion	Good
Chemical GWDTEs	Not assessed

3.3.3 Groundwater Protected Areas reported within the North Ayrshire water body are:

- North Ayrshire Coastal – Drinking Water Protection Zone.

4. WFD Screening

4.1 Stage 1: WFD Screening

4.1.1 The purpose of the WFD screening stage is to identify the extent to which activities involved in the Proposed Works may affect WFD water bodies. Activities can be screened out from further consideration if they are ongoing activities and thus form part of the baseline, or if there is no mechanism by which the activity could affect the status of WFD quality elements status pathway to any WFD water body.

4.1.2 Activities associated with the Proposed Works are detailed in **Table 4.1**, along with a screening assessment. Those activities screened in are taken forward to the Stage 2 Scoping stage. Where an activity is screened out, no further assessment is required.

Table 4.1 – Screening of activities for WFD assessment

Activity	Screen In/Out	Justification
All decommissioning phases		
Discharges of trade effluents via Active Effluent Discharge Line (AEDL)	OUT	The licence CAR/L/1000649 authorises discharges to the Largs Channel (Fairlie Roads) coastal surface water body of cooling water abstracted from the same water body and trade effluents from the existing water treatment plant arising from operation of HNB. While discharge of heated cooling water from the condensers has already ceased, a reduced flow of abstracted sea water is maintained to assist in conveying remaining trade effluents associated with defueling and other ongoing processes, as well as treated sewage discharges, through the existing large diameter sea outfall. The discharge of abstracted sea water will cease completely at an early stage during the Preparations for Quiescence phase of decommissioning, as discharges will be transferred to the AEDL once it has been installed. Therefore, the baseline for this ES assumes limited discharges of abstracted sea water, reducing to zero early in the decommissioning programme. These discharges, including the trade effluents and treated sewage, will continue to be authorised by the existing CAR licences and changes in these discharges are characterised within the baseline and are thus outside the scope of the EIA Decommissioning Regulations and, therefore, this WFD assessment. The licence will need to be varied to reflect the change in the nature of the infrastructure, with the existing outfall replaced by the AEDL discharging at exactly the same location. As these are existing trade effluent discharges where changes (reduction) in discharges do not form part of the decommissioning process, these discharges are screened-out from further consideration.

Activity	Screen In/Out	Justification
Discharges of sewage via Active Effluent Discharge Line (AEDL)	OUT	The license CAR/L/1010509 authorises an existing treated sewage discharge through the CW Outlet Tunnel into the Largs Channel (Fairlie Roads) coastal surface water body at the CW Outfall. This existing discharge will continue and will be made at exactly the same location as previously through the new AEDL (installed within the existing long sea outfall), once it is available. Discharge of treated sewage could affect WFD compliance of Bathing Waters and Shellfish Water Protected Areas, as well as phytoplankton and macroalgae quality elements and supporting physico-chemical elements (specifically nutrients). However, the sewage flows will be reduced compared with the current situation due to a lower number of workers on Site during decommissioning. As the discharge will remain at the same location and bacterial loads associated with the treated sewage discharge will be the same or reduced, there is no mechanism whereby the Proposed Works could result in any deterioration of bacterial quality and compromise the existing good status at relevant Bathing Waters and Shellfish Water Protected Areas. It is therefore screened-out of further consideration.
Discharges of radioactive wastewater	OUT	Discharges of treated radioactive effluent will be made through the AEDL and are assumed to contain the same or less radiological load than the discharges during operation of HNB. Effects associated with ongoing radioactive discharges from operational/defueling processes are scoped out on the grounds that they are existing discharges and the discharges are regulated under the rigorous requirements of the separate nuclear licensing regime.
The demolition of buildings and the undertaking of temporary groundworks on–site, including the construction and removal of the Safestore and waste facilities	OUT	The existing drainage system will be left in place throughout the Proposed Works, with discharges authorised by existing CAR licences CAR/L/1000648, CAR/L/1003329 and WPC/W/21392, and is designed to sufficiently accommodate surface water runoff. The existing system includes measures to capture and treat silt and oil interception. There will be no net increase in impermeable footprint on site. Embedded measures, including the water management measures described in Chapter 11 of the ES, involving good site management practices, such as wheel washing and tankering off site of any contaminated water, will ensure compliance with conditions in the existing licences. Thus, there will be no significant change in contaminant levels as a result of this activity in existing licenced surface water runoff from the Works Area to the Largs Channel (Fairlie Roads) coastal surface water body that could lead to an adverse effect on quality elements of the coastal water body. This activity can therefore be screened-out from further consideration.

Activity	Screen In/Out	Justification
Preparations for Quiescence phase		
Marine works associated with decommissioning and removal of marine infrastructure associated with the cooling water system (intake and jetty) and marine works to plug the sea outfall.	IN	The removal of structures at seabed level or below the seabed may affect hydromorphology, aquatic ecology and water quality elements due to the activities being carried out within the Largs Channel (Fairlie Roads) coastal surface water body, potentially affecting habitats and biology directly, and the potential for sediment mobilisation to affect water quality and, indirectly, biological quality elements. This activity is therefore screened-in for further consideration.
Discharges from draining down the cooling water tunnels before sealing and grouting	OUT	The discharges from draining down the cooling water tunnels before sealing will comprise only sea water abstracted from the Firth of Clyde and will be made in accordance with an approved Environmental Management Plan (EMP) which will include the requirement for testing to ensure that biocide (TRO) concentrations are less than EQS for coastal waters before discharge will be permitted. Therefore, there is no mechanism for adverse effects on biological, physico-chemical or chemical water quality elements in the receiving Largs Channel (Fairlie Roads) coastal surface water body. This activity can therefore be screened-out from further consideration.
Pumping and dewatering schemes	OUT	The potential need for dewatering will be considered in advance of excavation work, and if dewatering is anticipated, an assessment will be carried out in advance to identify suitable environmental measures to minimise the potential for contaminant mobilisation and to protect the water environment. Thus existing surface water drainage from the Site will not be subject to any significant additional loads of contaminants from dewatering, so there will be no potential for adverse effects on WFD quality elements in the receiving Largs Channel (Fairlie Roads) coastal surface water body. On this basis, potential dewatering activities are screened-out from further assessment.
Excavation works, and infilling activities on land within the Works Area during decommissioning	OUT	These activities have the potential to generate the mobilisation of silt or other contaminants. Substances may also be leached during the infilling process, resulting in changes to shallow groundwater quality with knock on effects on the surface water environment. This will be addressed by ensuring that fill used is not contaminated by ensuring 'Suitability for use' criteria are developed for material to be used as infill. Further embedded measures including site water management measures, drainage plan, drainage survey and surface water monitoring will minimise reduce any potential effects upon groundwater quality.

Activity	Screen In/Out	Justification
Land quality ground investigations	OUT	These activities have the potential for adverse effects on groundwater in superficial deposits and made ground and groundwater in the Kelly Burn Sandstone Formation Aquifer (bedrock) (Ayrshire Coastal groundwater body). Embedded measures reducing risks of a pollution incident include: ● ongoing surface water sampling to ensure the Proposed Works are not significantly impacting water quality; ● a site characterisation and assessment of land contamination risks to update and implement the waste management plan (WMP) and site-wide environmental safety case (SWESC) during the Proposed Works; ● a groundwater risk assessment will inform site characterisation undertaken in accordance with SEPA's position statement (WAT-PS-10-01), assigning Groundwater Assessment Criteria for Pollutant Inputs (v3.0 Aug 2014[41], or as amended); ● ongoing monitoring and drainage surveys will provide verification that the Proposed Works are not significantly impacting surface water quality and to confirm drainage condition, direction of flow and discharge points; ● additionally, good industry pollution prevention practices will be followed, as set out in CIRIA C532; ● where the Proposed Works have the potential to affect site drainage inputs or the permeability of the ground surface, the suitability of existing infrastructure and potential need for alternatives will be assessed and suitable alternatives defined in a plan prior to the activity commencing. On the basis of implementation of these embedded measures, the risk of contamination of the Ayrshire Coastal groundwater body groundwater will be reduced to a negligible level and these activities can therefore be screened-out of further consideration.
Land construction activities – ● **backfilling subsurface voids and reuse of site derived materials;** ● **construction of sub-surface structures, concrete laying and movement of materials;**	OUT	These activities have the potential for adverse effects on groundwater in superficial deposits and made ground and groundwater in the Kelly Burn Sandstone Formation Aquifer (bedrock) (Ayrshire Coastal groundwater body). The embedded measures to reduce risk of groundwater pollution include: ● good industry pollution prevention practices will be followed as set out in CIRIA C532; ● ongoing monitoring to provide verification that the Proposed Works are not significantly impacting water quality;

[41] Scottish Environment Protection Agency (2014). *Position Statement (WAT-PS-10-01) Assigning Groundwater Assessment Criteria for Pollutant Inputs*. Available online: https://www.sepa.org.uk/media/152662/wat_ps_10.pdf (Accessed 16 November 2023).

Activity	Screen In/Out	Justification
• **removal of drains (active and non-active drainage);** • **drilling/core slab drilling**		• adequate characterisation of soil and groundwater conditions, to inform the design of remedial measures if needed; • adequate assessment of the suitability of materials used for backfilling; • adequate planning and management of drilling works to limit the potential for pollution incidents. On the basis of implementation of these embedded measures, the risk of contamination of the Ayrshire Coastal groundwater body groundwater will be reduced to a negligible level and these activities can therefore be screened-out of further consideration.
Quiescence Phase		
Grounds Maintenance	OUT	It will be necessary to undertake grounds maintenance on site during this phase, with potential to impact groundwater and surface water quality. The existing drainage system will be left in place throughout the Proposed Works, with discharges authorised by existing CAR licences CAR/L/1000648, CAR/L/1003329 and WPC/W/21392, and is designed to sufficiently accommodate surface water runoff. The existing system includes measures to capture and treat silt and oil interception. It is anticipated that the type of grounds maintenance required will be no different from the existing situation and that surface water drainage discharges to the receiving Largs Channel (Fairlie Roads) coastal surface water body will not be materially changed. On this basis, grounds maintenance is screened-out from further assessment.
Final Site Clearance		
Demolition works and ground remediation	OUT	The existing drainage system will be left in place throughout the Proposed Works, with discharges authorised by existing CAR licences CAR/L/1000648, CAR/L/1003329 and WPC/W/21392, and is designed to sufficiently accommodate surface water runoff. The existing system includes measures to capture and treat silt and oil interception. There will be no net increase in impermeable footprint on site. Embedded measures, including the water management measures described in **Chapter 11**, involving good site management practices, such as wheel washing, best practice in remediated of contaminated land and tankering off site of any contaminated water, will ensure compliance with conditions in the existing licences. Thus there will be no significant change in contaminant levels in existing licenced surface water runoff from the Works Area to the Largs Channel (Fairlie Roads) coastal surface water body as a result of this activity that could lead to an adverse effect on quality elements of the coastal water body. This activity can therefore be screened-out from further consideration.

Activity	Screen In/Out	Justification
Land quality ground investigations	OUT	There is potential for effects on groundwater in superficial deposits and made ground and groundwater in the Kelly Burn Sandstone Formation Aquifer. Embedded measures reducing risks of a pollution incident are outlined above under preparations for quiescence. On the basis of implementation of these embedded environmental measures, the risk of contamination of the Ayrshire Coastal groundwater body groundwater will be reduced to a negligible level and these activities can therefore be screened-out of further consideration.
Pumping and dewatering schemes	OUT	The potential need for dewatering will be considered in advance of excavation work, and if dewatering is anticipated, an assessment will be carried out in advance to identify suitable environmental measures to minimise the potential for contaminant mobilisation and to protect the water environment. Thus existing surface water drainage from the Site will not be subject to any significant additional loads of contaminants from dewatering, so there will be no potential for adverse effects on WFD quality elements in the receiving Largs Channel (Fairlie Roads) coastal surface water body. On this basis, potential dewatering activities are screened-out from further assessment.
Land construction activities – ● **backfilling subsurface voids and reuse of site derived materials;** ● **construction of sub-surface structures, concrete laying and movement of materials;** ● **Removal of drains (active and non-active drainage);** ● **drilling/core slab drilling.**	OUT	These activities present a potential risk to the Ayrshire Coastal groundwater body. The embedded measures to reduce risk of groundwater pollution include: ● good industry pollution prevention practices will be followed as set out in CIRIA C532; ● ongoing monitoring to provide verification that the Proposed Works are not significantly impacting water quality; ● adequate characterisation of soil and groundwater conditions, to inform the design of remedial measures if needed; ● adequate assessment of the suitability of materials used for backfilling; ● avoid or lower the potential for the Proposed Works to result in the mobilisation of pre-existing contaminants; ● adequate planning and management of drilling works to limit the potential for pollution incidents. On the basis of implementation of these embedded environmental measures, the risk of contamination of the Ayrshire Coastal groundwater body groundwater will be reduced to a negligible level and these activities can therefore be screened-out of further consideration.

4.2 Stage 2: WFD Scoping

4.2.1 The WFD scoping stage defines the need and level of detail required for any further WFD assessment by identifying risks to the WFD receptors from the Proposed Works activities screened in above.

4.2.2 The single activity screened in for further assessment is:

- marine works associated with decommissioning and removal of marine infrastructure associated with the cooling water system (intake and jetty) and marine works to plug the sea outfall.

4.2.3 The area involved in these marine works has been estimated as covering 0.054 km^2, based on a jetty/intakes surface area of approximately 1200 m^2, plus a 100 m works buffer around the jetty to allow for associated marine vessel activity totalling 55,500 m^2, giving an overall total area for the marine works of 56,700 m^2 or 0.056 km^2. This represents 0.2% of the area of the Largs Channel (Fairlie Roads) coastal surface water body.

4.2.4 These results are presented for each WFD quality element in **Table 4.2** to **Table 4.5**, using the Environment Agency's scoping template for estuarine and coastal waters. Note that these include the single activity screened-in and taken forward to scoping.

Hydromorphology

4.2.5 **Table 4.2** assesses the potential impact of the single screened-in Proposed Works activity against the WFD hydromorphology quality elements for the relevant coastal surface water bodies.

Table 4.2 – WFD scoping of the Proposed Works activities against WFD hydromorphology receptors

Consider if your activity may impact hydromorphology:	Risk to receptor (Yes/No)	Scoping outcome justification
Hydromorphology		
Could the Proposed Works impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status?	Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)	
	No	The Largs Channel (Fairlie Roads) Coastal Water Body is currently assessed at good status.
	Seamill and Ardrossan Coastal Surface Water Body (ID: 200024).	
	Yes	The Seamill and Ardrossan Coastal Surface Water Body is currently assessed at high status.
Could the Proposed Works significantly impact the hydromorphology of any water body?	Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)	
	Yes	The removal of the piled (and therefore porous) jetty and intake structures will remove a minor obstruction to tidal currents within 170m of the shore and marginally reduce shelter of the coastline immediately to the north of the jetty.

Consider if your activity may impact hydromorphology:	Risk to receptor (Yes/No)	Scoping outcome justification
	Seamill and Ardrossan Coastal Surface Water Body (ID: 200024).	
	No	Given the distance from the jetty to the boundary of this water body (>3 km), the minimal footprint of the jetty (extending 170 m from shore in a channel 2,500 m wide) and its porous nature, the potential for hydromorphological effects in this water body can be scoped-out of the assessment.
Are the Proposed Works in a water body that is heavily modified for the same use as your activity?	Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)	
	No	The Largs Channel (Fairlie Roads) Coastal Surface Water Body is not a HMWB.
	Seamill and Ardrossan Coastal Surface Water Body (ID: 200024).	
	No	The Seamill and Ardrossan Coastal Surface Water Body is not a HMWB.

Biology

4.2.6 **Table 4.3** assesses the potential impact of the single screened-in Proposed Works activity against the WFD biological quality elements for the relevant coastal surface water bodies.

4.2.7 The assessment against biological receptors requires consideration against the presence of higher and lower sensitivity habitats. Within the Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026) the Proposed Works could potentially impact upon:

- higher sensitivity habitats present:
  - seagrass beds, subtidal kelp beds;
- lower sensitivity habitats present:
  - intertidal soft sediments (sand and mud), subtidal soft sediments, shingle.

Table 4.3 – WFD scoping of the Proposed Works activities against WFD biological receptors

Consider if the footprint of the activity may impact the biological receptors:	Risk to Receptor (Yes/No)	Scoping Outcome Justification
Is the footprint of the Proposed Works 0.5km^2 or larger?	Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)	
	No	The marine works cover approximately 0.056 km^2 (5.6 ha).
	Seamill and Ardrossan Coastal Surface Water Body (ID: 200024)	

Consider if the footprint of the activity may impact the biological receptors:	Risk to Receptor (Yes/No)	Scoping Outcome Justification
	No	No works will take place within this water body
Is the footprint of the Proposed Works 1% or more of the water body's area?	Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)	
	No	The marine works cover approximately 0.056 km^2, 0.2% of the water body area
	Seamill and Ardrossan Coastal Surface Water body (ID:200024)	
	No	No works will take place within this water body
Is the footprint of the Proposed Works within 500m of any higher sensitivity habitat?	Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)	
	Yes	The Proposed Works are 200 m from Southannan Sands SSSI where dwarf eelgrass (*Zostera noltii*) beds are found. Subtidal kelp beds are present <500m north west of the Proposed Works.
	Seamill and Ardrossan Coastal Surface Water body (ID:200024)	
	No	This water body is >500m from the Proposed Works.
Is the footprint of the Proposed Works 1% or more of any lower sensitivity habitat?	Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)	
	No	The footprint of the marine works is only 0.056 km^2. It includes very small areas of intertidal soft sediments (sand and mud) and subtidal soft sediments, while these are extensive elsewhere in the water body There is no significant occurrence of shingle in the vicinity of the marine works. It is estimated that the extent of lower sensitivity habitat affected is well below 1% of the areas of these habitats present within the water body.
	Seamill and Ardrossan Coastal Surface Water body (ID:200024).	
	No	No works will take place within this water body
Biology – Fish		
Are the Proposed Works in an estuary and could they affect fish in and outside the estuary, could it delay or prevent fish entering it and could it affect fish migrating through the estuary?	Inland transitional water bodies	
	No	The Proposed Works are approximately 26km south of the Clyde Estuary Outer transitional water body (ID 200320), where fish are a quality element for classification.

Consider if the footprint of the activity may impact the biological receptors:	Risk to Receptor (Yes/No)	Scoping Outcome Justification
Could the Proposed Works impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)?	Inland transitional and river water bodies	
	No	Any works that would obstruct passage of migratory fish could affect WFD status of inland transitional and river water bodies. In this case the porous (piled) jetty and intakes that are the subject of the marine works extend only 170 m into the Hunterston Channel. Use of works vessels could extend the potential for effects of works by another 100 m to 270 m from shore and to a water depth of about 5 m below chart datum. Hunterston Channel at this point is approximately 2,500 m wide reaching depths of over 50 m. The Firth of Clyde Channel to the west of Little Cumbrae Island is of a similar width but reaches depths of over 100 m. Thus any obstruction to migratory fish will affect an insignificant proportion of the available channel and will have no detectable effect. The outfall requiring installation of a plug and the AEDL is a single point location and obstruction to migratory fish will be negligible. No explosives will be used, thus avoiding potential fish mortalities from this source. There will, therefore, be no effect on migratory fish that could affect the status of inland transitional and river water bodies.
Could the Proposed Works cause entrainment or impingement of fish?	Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)	
	No	Cessation of abstraction of sea water does not form part of the decommissioning process but will remove any existing potential for fish impingement. The decommissioning process will not include any abstraction of sea water, therefore there will be no risk of entrainment or impingement of fish as a result of the Proposed Works.

Water Quality

4.2.8 **Table 4.4** assesses the potential impact of the single screened-in Proposed Works activity against the WFD water quality elements for the relevant coastal surface water bodies.

Table 4.4 – WFD scoping of the Proposed Works activities against WFD water quality receptors

Consider if the activity may impact water quality:	Risk to Receptor (Yes/No)	Scoping Outcome Justification
Could the Proposed Works affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)?	Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)	
	Possible	To avoid mobilisation of contaminated sediments and consequent effects on water quality, the jetty will be dismantled from the shore at low tide and piles will not be withdrawn but will be cut off at or just below seabed level. The HNB outfall will simply be capped using a jack-up or anchored barge and the new AEDL will utilise the existing cooling water tunnel and outfall to avoid any need for trenching of the seabed. Any effects on water quality due to minor unavoidable sediment mobilisation will be discontinuous, temporary and minimal.
Is the Proposed Works in a water body with a history of harmful algae?	Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)	
	No	The water body does not have a history of harmful algae.
Is the Proposed Works in a water body with a phytoplankton status of moderate, poor, or bad?	Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)	
	No	The water body has a phytoplankton status of High.
If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if the chemicals are on the Environmental Quality Standards Directive (EQSD) list.	Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)	
	Possible	Releases of chemicals may arise from sediment disturbance during removal of the jetty and intakes but this will be minimised by cutting off piles at just below seabed level instead of withdrawing them. Plugging the outfall is not expected to lead to any sediment disturbance. No explosives will be used, so sediment disturbance from use of this method will be avoided.
If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if it disturbs sediment with contaminants above Cefas Action Level 1.	Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)	
	Possible	Marine sediments in the vicinity of the Works Area may be contaminated due to the historical presence of industry in the area but detailed local data are not available, so a comparison cannot be made with Cefas Action Level 1.

Consider if the activity may impact water quality:	Risk to Receptor (Yes/No)	Scoping Outcome Justification
		These action levels were developed in relation to disposal of dredgings; no dredging is proposed as part of the marine decommissioning works. The approach adopted is therefore to select deconstruction methods that avoid sediment disturbance as far as possible.
If your activity has a mixing zone (like a discharge pipeline or outfall) consider if the chemicals released are on the Environmental Quality Standards Directive (EQSD) list.	Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)	
	No	Discharges have been screened-out - see **Table 4.1**.

Protected Areas and INNS

4.2.9 **Table 4.5** assesses the potential impact of the Proposed Works against the WFD Protected Areas and INNS receptors for the screened coastal water bodies.

Table 4.5 – WFD scoping of the Proposed Works activities against WFD Protected Areas and INNS receptors

Consider if the Activity may Impact Protected Areas or INNS:	Risk to Receptor (Yes/No)	Scoping Outcome Justification
Is the Proposed Works within 2km of any WFD protected area?	No	All protected areas (bathing waters and shellfish waters are more than 2 km from the marine works. (Note that the potential for more distant effects on bathing waters due to transport of the plume from sewage discharges has been screened-out - see **Table 4.1**).
Could the Proposed Works introduce or spread INNS?	No	There is potential to spread the INNS *Sargassum muticum* that was identified during the subtidal benthic surveys, during the deconstruction of the marine infrastructure. Ballast water from works vessels travelling from other areas cold also introduce INNS. However, a Biosecurity Management Plan will be established for the Proposed Works, implemented as part of the EMP, effectively eliminating the risk of INNS spread.

5. WFD compliance assessment

5.1 WFD Quality Elements

5.1.1 **Table 5-1** assesses the potential impact of the Proposed Works against each of the WFD quality elements for surface water bodies scoped in at the scoping stage. Risks and quality elements scoped-out are not included in **Table 5.1**. Effects on the Ayrshire Coastal groundwater body were screened-out at Stage 1.

5.1.2 Note that the risks identified during scoping relate to the single activity screened in to be taken forward to scoping, which is:

- marine works associated with decommissioning and removal of marine infrastructure associated with the cooling water system (intake and jetty) and marine works to plug the sea outfall.

Table 5.1 – Potential impacts of the Proposed Works activities against WFD quality elements for coastal water bodies

WFD Quality Elements	Potential Impacts
Hydromorphological Quality Elements	
Depth variation **Quality, structure and substrate of the bed** **Structure of the intertidal zone** **Freshwater zone** **Wave exposure**	While the removal of the open structured jetty and intake structures will remove a minor obstruction to tidal currents within 170 m of the shore and reduce marginally the shelter of the coastline immediately to the north of the jetty, this will be minimal due to the small scale of the jetty compared with the overall dimensions of Hunterston Channel (2,500 m wide and over 50 m deep in the centre) and will have no measurable effect on the shoreline, which comprises mainly large boulders in the vicinity of the jetty. Permanent effects on the seabed will be limited to the footprint of the jetty and intakes only (about 1200 m^2 or 0.004% of the area of the Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026)). These minor changes could be argued to involve restoring a more natural hydrodynamic regime to the area and thus an improvement to the status of the WFD hydromorphological quality elements but the changes will be so small that there will be no significant effect on WFD compliance for these quality elements. The outfall will simply be plugged and the AEDL installed through the plug. This activity will have no effect on any WFD hydromorphological quality element. Neither removal of the jetty nor plugging the outfall will have any effect on the extent of the freshwater influence at HNB. Therefore the activity will have no current or future adverse effect on compliance of the coastal water body with WFD hydromorphological quality elements.
Biological Quality Elements	
Composition and abundance of other aquatic flora	The jetty and intakes are within 500m of a higher sensitivity habitat, subtidal kelp beds and the outfall is within 500 m of Southannan Sands SSSI where subtidal seagrass beds have been recorded. Plugging the outfall will involve minimal disturbance of the seabed, limited to temporary placing of jack-up barge spud legs or anchoring of

WFD Quality Elements	Potential Impacts
	a floating work platform. This will not be within the seagrass beds so will have no effect on this receptor. There will thus be no adverse effect on WFD compliance for the angiosperms quality element related to effects on seagrass. The jetty and outfalls are in shallow water and the subtidal kelp beds are further offshore. The works will not extend significantly into the kelp forest areas and the limited sediment disturbance that may occur will have no effect on kelp growth. There will thus be no adverse effect on WFD compliance for the macroalgae quality element related to effects on kelp.
Chemical/Physico-Chemical and Chemical Quality Elements	
Turbidity **Water temperature** **Oxygenation conditions** **Nutrient conditions** **Specific pollutants** **Hazardous substances**	The scoping stage identified the possibility of temporary increases in turbidity and contaminants in the water column due to mobilisation of sediments during the marine works to remove the jetty and intakes. Applying the agreed embedded environmental measures to minimise sediment mobilisation, in particular, cutting off piles at or just below the seabed rather than withdrawing them or using explosives, will limit sediment mobilisation to a small quantity around each pile during deconstruction. The intake and jetty deck will be demolished by cutting sections of the deck of the intake structure and lifting this away by crane (located on the jetty) then removing the deck of the jetty. Each section of deck will be transported to a processing area. As much work as possible will be carried out from the land and the jetty, making full use of access during low tide periods, to minimise the extent and duration of work using vessels and thus minimise sediment mobilisation due to anchoring or use of jack-up vessels. As the area of seabed occupied by the jetty and intake structures is minimal (only 0.004% of the area of the Largs Channel (Fairlie Roads) Coastal Surface Water Body), the works will be intermittent and of short overall duration and the above embedded environmental measures will be in place to minimise sediment mobilisation, it will be possible to avoid adverse impacts on WFD compliance with water quality elements.

5.2 Water body compliance

5.2.1 The conclusion of the WFD compliance assessment is that, subject to implementation of the embedded measures proposed in the EMP, there will be no deterioration or adverse effects of current or future WFD status arising from the Proposed Works for the following water bodies:

- Largs Channel (Fairlie Roads) Coastal Surface Water Body (ID: 200026);
- Seamill and Ardrossan Coastal Surface Water Body (ID: 200026);
- Ayrshire Coastal Groundwater Body (ID: 150785).

5.2.2 Compliance with WFD requirements will, however, be subject to effective implementation of the embedded environmental measures set out within Section 5 of the Outline EMP.

13.

Historic Environment

Appendix 13A: Designated Heritage Assets

Appendix 13A
Designated heritage assets

Table 13A.1 Listed buildings within 5 km Study Area

Listing Ref	Name	Category	Easting	Northing
LB13899	Old Harbour, Portencross	B	217559	648936
LB13899	North Harbour, Portencross	B	217559	64990
LB14279	Law Castle	A	221094	648416
LB14281	Castle Cottage, Portencross	C	217568	648877
LB14281	West Cottage, Portencross	C	217575	648868
LB14282	Crosbie, West Kilbride	B	221816	650059
LB14283	Lawoodhead	B	221318	649106
LB14285	Seamill	B	220202	647122
LB14286	Hunterston House	B	219207	651739
LB14287	Well, Hunterston House	C	219201	651765
LB14288	Walled Garden, Hunterston House	C	219212	651459
LB14306	Churchyard, Barony Parish Church, Main Street, West Kilbride	C	220622	648350
LB14306	Barony Parish Church, Main Street, West Kilbride	C	220637	648346
LB14307	St Andrews Church, Main Street, West Kilbride	B	220667	648425

Listing Ref	Name	Category	Easting	Northing
LB14308	Kirktonhall House, Main Street, West Kilbride	B	220505	648302
LB14309	Sundial, Kirktonhall, West Kilbride	A	220521	648272
LB14310	Monument To Dr. Robert Simpson, Cemetery, West Kilbride	C	220663	648729
LB14312	West Kilbride Railway Station	B	220872	648441
LB14313	Hunterston Castle	A	219285	651471
LB14314	Hunterston Gate, Hunterston House	B	220139	652102
LB14315	Hunterston Gate, Hunterston House	B	219980	650160
LB19686	Carlung House	B	219566	649070
LB37823	25 Bute Terrace, Millport, Great Cumbrae Island	C	216177	655118
LB37824	Cathedral Of The Isles And Collegiate Church Of The Holy Spirit, College Street, Millport, Great Cumbrae Island	A	216577	655240
LB37825	The Garrison, Glasgow Street, Millport, Great Cumbrae Island	B	216423	655029
LB37825	East Gates, The Garrison, Millport, Great Cumbrae Island	B	216471	655015
LB37826	General, Millport Harbour, Great Cumbrae Island	B	216310	654835
LB37827	Mid Kirkton, Millport, Great Cumbrae Island	B	215756	655168

Listing Ref	Name	Category	Easting	Northing
LB37828	Mid Kirkton, Millport, Great Cumbrae Island	B	215787	655142
LB37829	Kirkton House, Millport, Great Cumbrae Island	B	215689	655232
LB37830	Millburn, West Bay Road, Millport, Great Cumbrae Island	B	215871	654796
LB37832	8 Cardiff Street, Millport, Great Cumbrae Island	C	215995	654776
LB37832	4 Cardiff Street, Millport, Great Cumbrae Island	C	216009	654768
LB37832	10 Cardiff Street, Millport, Great Cumbrae Island	C	215987	654777
LB37832	6 Cardiff Street, Millport, Great Cumbrae Island	C	216003	654770
LB37833	5-7 Clyde Street, Millport, Great Cumbrae Island	C	216011	654697
LB37833	1-3 Clyde Street, Millport, Great Cumbrae Island	C	216018	654705
LB37834	8 And 9 Quayhead, Millport, Great Cumbrae Island	B	216028	654715
LB37835	Fairlie Bank, 12 Bute Terrace, Millport, Great Cumbrae Island	C	216080	654986
LB37836	Springfield, 14 Bute Terrace, Millport, Great Cumbrae Island	B	216106	655006
LB37837	16 Bute Terrace, Millport, Great Cumbrae Island	C	216128	655021
LB37838	Strahoun, 24 Bute Terrace, Millport, Great Cumbrae Island	C	216208	655060

Listing Ref	Name	Category	Easting	Northing
LB37839	18 Kelburn Street, (formerly Devonport Place) Millport, Great Cumbrae Island	C	216978	655170
LB37839	15-17 Kelburn Street, (Formerly Devonport Place) Millport, Great Cumbrae Island	C	216970	655160
LB37839	22 Kelburn Street (formerly Devenport Place) , Millport, Great Cumbrae Island	C	216996	655192
LB37839	23 Kelburn Street (formerly Devonport Place), Millport, Great Cumbrae Island	C	217000	655196
LB37839	19 Kelburn Street, (formerly Devonport Place) Millport, Great Cumbrae Island	C	216984	655175
LB37839	21 Kelburn Street (formerly Devonport Place), Millport, Great Cumbrae Island	C	216992	655186
LB37839	24-25 Kelburn Street (formerly Devonport Place), Millport, Great Cumbrae Island	C	217007	655204
LB37839	20 Kelburn Street, (formerly Devonport Place) Millport, Great Cumbrae Island	C	216988	655181
LB37839	14 Kelburn Street, (Formerly Devonport Place) Millport, Great Cumbrae Island	C	216958	655147
LB37840	13 Kelburn Street, Millport, Great Cumbrae Island	C	216948	655132
LB37840	10, 11, 12 Kelburn Street, Millport, Great Cumbrae Island	C	216940	655124

Listing Ref	Name	Category	Easting	Northing
LB37841	8 And 9 Kelburn Street, Millport, Great Cumbrae Island	C	216932	655114
LB37842	6 Kelburn Street, Millport, Great Cumbrae Island	C	216913	655095
LB37842	7 Kelburn Street, Millport, Great Cumbrae Island	C	216922	655105
LB37843	Eastwood, 9, 10, 11 Marine Parade, Millport, Great Cumbrae Island	B	217253	655172
LB43209	Teacher's Training Centre, Seamill, West Kilbride	A	220448	647223
LB50774	73 Main Street And 1 Hunterston Road	C	220583	648375
LB50968	Including Boundary Wall And Gatepiers, Cumbrae Parish Church (Church Of Scotland), Bute Terrace, Millport	C	216041	654994
LB51402	Gatepiers And Gates, Including Boundary Wall, Overton Church (Church Of Scotland), Ritchie Street	B	220297	648132
LB51722	Including Boundary Wall, Fairlie Lodge, 59 Main Road, Fairlie	C	220925	655317
LB52288	Millport Field Centre, Marine Parade, Millport	C	217556	654505
LB7291	Fairlie Parish Church Hall, Main Road, Fairlie	C	220987	655221
LB7292	School Brae Fairlie School And Gate Piers, Fairlie	B	221042	655254

Listing Ref	Name	Category	Easting	Northing
LB7293	Parker Memorial Hall, Main Road, Fairlie	B	220985	655156
LB7314	Burnside, 8 Burnfoot Road, Fairlie	B	220959	654713
LB7315	Fairlie Castle	B	221283	654890
LB7316	Rockhaven, The Causeway, Fairlie	C	220888	655097
LB7317	St Paul's Parish Church, Main Road, Fairlie	B	220984	655611
LB852	Cumbrae Lighthouse, Little Cumbrae Island	B	213760	651514

Table 13A.2 Scheduled Monuments within 5 km Study Area

Designation Ref	Name	Easting	Northing
SM2175	Auld Hill,fort,Portencross	217829	649119
SM2195	Little Cumbrae Castle	215254	651335
SM317	Fairlie Castle	221286	654892
SM327	Portencross Castle	217543	648926
SM3305	Castle Hill,earthwork SSE of Glenside	220771	652553
SM333	Southannan Mansionhouse,Fairlie	220921	653845
SM3336	Bushglen Mount,ENE of Bushglen	221143	649864

Designation Ref	Name	Easting	Northing
SM3694	Castle Knowe,motte	220346	650826
SM418	Little Cumbrae,lighthouse tower & associated buildings	214308	651479

Table 13A.3 Inventory Gardens and Designed Landscapes within 5 km Study Area

Designation ref	Name	Easting	Northing
GDL00233	Kelburn Castle	221620	656810

Table 13A.4 Conservation Areas within 5 km Study Area

Name	Easting	Northing
Millport Conservation Area	216423	655039
West Kilbride Conservation Area	220489	648299

Appendix 13B: Non-Designated Heritage Records and Previous Investigations ('Events')

Appendix 13B Non-designated heritage records and previous investigations ('events')

Table 13B.1 WoSAS HER monument point records within 500 m Study Area

WoSAS HER Ref	Name	Monument type	Easting	Northing
5234	Fences	Flints	218700	651300
5235	Fences	Cinerary Urn; Bead	218600	651500
5238	Hawking Craig	'Homestead'	218000	650900
5243	Hunterston Sands / Fairlie Roads	Fish Traps	218200	651900
5244	Hunterston, Nuclear Generating Stations / Hunterston Power Station	Electricity Generating Station	218540	651500
5245	Hawking Cave	Cave; Pottery; Flint	217945	650795
5246	Hunterston / Hunterstone	Axe-hammer	219260	651520
5247	Hunterston / 'The Hunterston Brooch'	Brooch	217800	650500
5248	Hawking Craig	Cairn; Battle Site	217800	650600
5250	Hawking Craig	Cists; Cinerary Urns; Coins	217900	650500
13446	Hunterston 'A' Power Station / Hunterston	Electricity Generating Station	218250	651250

WoSAS HER Ref	Name	Monument type	Easting	Northing
	Nuclear Generating Station			
14108	Hunterston 'B' Power Station / Hunterston Nuclear Generating Station	Electricity Generating Station	218550	651450
43001	Hunterston House, Walled Garden	Walled Garden	219212	651459
55532	Stoney Port / Hunterston	Landing Point	217900	651700
55533	Hunterston, Tidal Ponds / Stoney Port; Firth Of Clyde; Inner Clyde Estuary	Fish Trap	217920	651630
55534	Hunterston, Landing Stage / Fairlie Roads	Dolphin	217677	651657
55535	Hunterston, Pier / Fairlie Roads	Pier	217541	650681
62916	Hunterston Jetty	Jetty	218841	652183
62917	Hunterston	Track	218998	652008
66202	Stoney Port	Limekiln	218075	651685
67724	Hunterston	Roundhouse; Pits; Postholes; Carved Stone	218804	651111
67725	Hunterstone	Roundhouse; Pits; Postholes; Carved Stone	218710	651110

WoSAS HER Ref	Name	Monument type	Easting	Northing
67726	Hunterston	Roundhouse; Pits; Postholes; Carved Stone	218784	651365
95274	Hunterston Nuclear Generating Station	Pit (Period Unassigned), Post Hole(s) (Period Unassigned), Unidentified Pottery (Iron Age)	218470	650960
95959	Hunterston Nuclear Generating Station, Goldenberry	Farmstead (19th Century)	218418	651074

Table 13B.2 WoSAS HER NSR records within 5 km Study Area

WoSAS HER ref	Name	Monument type	Easting	Northing
5228	Sheanawally Point, Little Cumbrae	Cairns	215552	652924
5265	St. Vey's Tomb, Little Cumbrae Island	Tomb	214665	651888
5266	St. Vey's Chapel, Little Cumbrae Island	Chapel	214775	651810
5268	Little Cumbrae Island	Long Cists	214660	651873
5605	Law Hill	Fort	221555	648445
5785	Little Caldron	Cairn (possible)	223150	651000

WoSAS HER ref	Name	Monument type	Easting	Northing
5789	Kaim Hill	Homestead	221315	652775
5797	Biglees Hill	Cairn	221125	651965
5798	Diamond Hill / Kaim Hill	Standing Stone (possible)	221535	653925
5804	Diamond Hill	Cup-and-ring-markings	221395	653905
5809	Caldron Hill	Cairn (possible)	222895	651145

Table 13B.3 WoSAS HER event point records within 5 km Study Area

WoSAS Event Ref	Name	Easting	Northing
5359	Archaeological Mitigation: Hunterston Convertor and Substation, West Kilbride, North Ayrshire	218750	651210
5402	Archaeological Monitoring: Hunterston Converter and Substation, West Kilbride, North Ayrshire	218340	650930
5403	Archaeological Mitigation: Area A, Hunterston Convertor and Substation, West Kilbride, North Ayrshire	218355	651013
5404	Archaeological Evaluation and Building Recording: Goldenberry Farm, Hunterston Convertor and Substation, West Kilbride, North Ayrshire	218413	651072
5405	Archaeological Mitigation, Area B: Hunterston East Substation, West Kilbride, North Ayrshire	218720	651240
5406	Archaeological Mitigation: Area D, Hunterston Convertor and Substation, West Kilbride, North Ayrshire	218880	651200

WoSAS Event Ref	Name	Easting	Northing
5407	Hunterston Converter and Substation, West Kilbride, North Ayrshire: Strip Map Sample	218760	651160
5582	Archaeological Mitigation: Hunterston North Substation, West Kilbride, North Ayrshire	218855	651321

Table 13B.4 Ayrshire Designed Landscapes within 5 km Study Area

Name	Easting	Northing
Kelburn	221705	656410
Southannan	221076	653440
Hunterston	218875	651167
Carlung	219582	648922
Crosbie	221996	649710

14.

Landscape and Visual Impact Assessment

Appendix 14A: Landscape and Visual Impact Assessment Methodology

November 2023

Appendix 14A
Landscape and Visual Impact Assessment Methodology

14A.1 Introduction

14.1.1 This appendix describes the methodology used for the landscape and visual impact assessment (LVIA) for the Proposed Works Proposed Works.

14.1.2 This appendix has been structured as follows:

- Overview of LVIA Methodology;
- Assessing Landscape Effects;
- Assessing Visual Effects;
- Assessing Cumulative Landscape and Visual Effects;
- Evaluation of Significance;
- Nature of Effect; and
- Visualisations.

14A.2 Overview of LVIA methodology

14.2.1 The LVIA assesses the likely effects of the Proposed Works on the landscape and visual resource, encompassing effects on landscape elements, characteristics and landscape character, designated landscapes, visual effects and cumulative effects.

14.2.2 Essentially, the landscape and visual effects (and whether they are significant) is determined by an assessment of the nature or 'sensitivity' of each receptor or group of receptors and the nature of the effect or 'magnitude of change' that would result from the Proposed Works. The evaluation of sensitivity takes account of the value and susceptibility of the receptor to the Proposed Works. This is combined with an assessment of the magnitude of change which takes account of the size and scale of the proposed change, the geographical extent and the duration of that change. By combining assessments of sensitivity and magnitude of change, a level of landscape or visual effect can be evaluated and determined.

14.2.3 The resulting level of effect is described in terms of whether it is significant or not significant and the type of effect is described as either direct or indirect; temporary or permanent (reversible); cumulative; and beneficial, neutral or adverse.

14.2.4 The time period for the assessment covers phases of development related to the phases of the Proposed Works:

- Preparations for Quiescence phase (12 years);
- Quiescence phase (70 years); and
- Final Site Clearance (12 years).

14.2.5 LVIA unavoidably involves a combination of both quantitative and subjective assessment and wherever possible a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.

Defining the LVIA Study Area

14.2.6 The selection of the LVIA Study Area has been undertaken in accordance with guidance set out in Sections 5.2 and 6.2 in GLVIA 3[1] which places an emphasis on a "*reasonable approach which is proportional to the scale and nature of the proposed development*" and the findings of the field survey. The definition of the Study Area has been informed by the extent of the preliminary Zone of Theoretical Visibility map (ZTV) generated for the tallest, long-term component of the Development Works.

14A.3 Assessing landscape effects

14.3.1 Landscape effects are defined by the Landscape Institute in GLVIA 3[1], paragraphs 5.1 and 5.2 as follows:

"An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern ... is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. ... The area of landscape that should be covered in assessing landscape effects should include the site itself and the full extent of the wider landscape around it which the development may influence in a significant manner."

Landscape character

14.3.2 GLVIA 3[1], paragraph 5.4, advises that Landscape Character Assessment should be regarded as the main source for baseline studies and identifies the following factors which combine to create areas of distinct landscape character:

- *"the elements that make up the landscape in the Study Area including:*
  - *physical influences – geology, soils, landform, drainage and water bodies;*
  - *landcover, including different types of vegetation and patterns and types of tree cover; and*
  - *the influence of human activity, including land use and management, the character of settlements and buildings, and pattern and type of fields and enclosure.*
  - *The aesthetic and perceptual aspects of the landscape – such as, for example, its scale, complexity, openness, tranquillity or wildness;*
  - *The overall character of the landscape in the Study Area, including any distinctive Landscape Character Types or Areas that can be identified, and the particular combinations of elements and aesthetic and perceptual aspects that make each distinctive, usually by identification as key characteristics of the landscape."*

[1] Landscape Institute and IEMA (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition

Landscape effects

14.3.3 The potential landscape effects occurring during the phases of the Proposed Works may therefore include, but are not restricted to, the following:

- **Changes to landscape elements:** The addition of new elements (large buildings for example) or the removal of existing elements such as trees, vegetation, buildings and other characteristic elements or valued features of the landscape character;
- **Changes to landscape qualities:** Degradation or erosion of landscape elements and patterns and perceptual characteristics, particularly those that form key characteristic elements of the landscape character or contribute to the landscape value;
- **Changes to landscape character:** Landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities (including perceptual characteristics) and the addition of new features, the magnitude of which is sufficient to alter the overall landscape character within a particular area;
- **Changes to designated landscapes:** Including nationally and locally designated landscapes and Wild Land Areas (WLA) that would affect the special landscape qualities underpinning these areas and their integrity; and
- **Cumulative landscape effects:** Where more than one development of a similar type may lead to a cumulative landscape effect.

14.3.4 Development may have a direct effect on the landscape as well as an indirect effect which would be perceived from the wider landscape outside the immediate site area and its associated landscape character. Landscape effects also have to be recognised in terms of change over time where natural and manmade processes can alter the landscape.

Evaluating landscape sensitivity to change

14.3.5 The assessment of sensitivity takes account of the landscape value and the susceptibility of the receptor to the Proposed Works.

14.3.6 Landscape sensitivity often varies in response to both the type and phase of the development proposed and its location, such that landscape sensitivity needs to be considered on a case-by-case basis. It should not be confused with ‘inherent sensitivity’ where areas of the landscape may be referred to as inherently of ‘high’ or ‘low’ sensitivity. For example, a National Park may be described as inherently of high sensitivity on account of its designation and value, although it may prove to be less sensitive or susceptible to particular development, and of variable sensitivity across its geographical area. Alternatively, an undesignated landscape may be of high sensitivity to a particular development regardless of the lack of local or national designation.

Value of the Landscape Receptor

14.3.7 The value of a landscape receptor is a reflection of the value that society attaches to that landscape. The assessment of the landscape value is classified as high, medium or low and the basis for this assessment is made clear using evidence and professional judgement, based on the following range of factors:

- **Landscape designations:** A receptor that lies within the boundary of a recognised landscape related planning designation will be of increased value (depending on the proportion of the receptor that is affected) and the level of importance of the designation which may be international, national, regional or local. The absence of

designation does not, however, preclude value since an undesignated landscape receptor may be valued as a resource in the local or immediate environment;

- **Landscape quality:** The quality of a landscape receptor is a reflection of its attributes, such as scenic quality, sense of place, rarity and representativeness and the extent to which its valued attributes have remained intact. A landscape with consistent, intact, well-defined and distinctive attributes is considered to be of higher quality and, in turn, higher value than a landscape where the introduction of elements has detracted from its character; and
- **Landscape experience:** The experiential qualities that can be evoked by a landscape receptor can add to its value. These responses relate to a number of factors including cultural associations that may exist in art, literature or history; the recreational value of the landscape or the iconic status of the landscape in its own right; and its contribution of other values such as nature conservation or archaeology.

Landscape Susceptibility to Change

14.3.8 The susceptibility of a landscape receptor to change is a reflection of its ability to accommodate the changes that will occur as a result of the Proposed Works without undue consequences for the maintenance of the baseline situation and / or the achievement of landscape planning policies and strategies. Some landscape receptors are better able to accommodate development than others due to certain characteristics that are indicative of capacity to accommodate change. These characteristics may or may not also be special landscape qualities that underpin designated landscapes.

14.3.9 The assessment of the susceptibility of the landscape receptor to change is classified as high, medium or low, and the basis for this assessment is made clear using evidence and professional judgement. Indicators of landscape susceptibility to the type of development proposed (decommissioning) are based on the following criteria:

- **Overall Strength and Robustness:** Collectively, the overall characteristics and qualities of a particular landscape result in a strong and robust landscape that is capable of reasonably accommodating the Proposed Works without undue adverse effects on the special landscape qualities (in the case of a designated landscape) or the key characteristics for which an area of landscape character or a particular element is valued;
- **Landscape Scale and Topography:** The scale and topography are large enough to physically accommodate the development footprint without the requirement of invasive earthworks or drainage. Topographical features such as narrow valleys or more complex and small-scale landforms such as drumlins, incised river valleys / gorges, cliffs or rock outcrops are likely to be more susceptible to this type of development than broad, homogenous topography;
- **Openness** in the landscape may increase susceptibility to change because it can result in wider visibility of the Proposed Works; however, open landscape may also be larger in scale and simple, which would decrease susceptibility. Conversely, enclosed landscapes can offer more screening potential, limiting visibility to a smaller area. However, they may also be smaller in scale and more complex which would increase susceptibility;
- **Land Cover Pattern:** Ancient and mature or long-established vegetation such as mature trees, woodland and protected hedgerows are likely to be more susceptible to the Proposed Works, particularly where these elements form part of a valued characteristic landscape pattern or feature. Conversely, grassland and / or forestry are likely to be less susceptible to development;

- **Skyline:** Prominent and distinctive skylines and horizons with important landmark features that are identified in the landscape character assessment are generally considered to be more susceptible to development in comparison to broad, simple skylines which lack landmark features or contain other infrastructure features;
- **Relationship with other Development and Landmarks:** Contemporary landscapes where there are existing forms of development (industry, mineral extraction or electrical grid connections) that already have a characterising influence result in a lower susceptibility to development in comparison to areas characterised by smaller scale, historic development and landmarks (historic villages with dense settlement patterns and associated buildings, such as church towers). It should be noted that some existing development, for example wind energy development, is time limited and subject to decommissioning;
- **Rationale:** Some site locations have an obvious visual rationale for the Proposed Works in terms of the available space, access, simplicity and relationship to other similar forms of development. Conversely, a site may appear overly constrained and require greater engineering or additional construction activity to accommodate the Proposed Works with lower design quality and few embedded environmental measures;
- **Remoteness, Naturalness, Wildness / Tranquillity:** Notably landscapes that are acknowledged to be particularly scenic, wild or tranquil are generally considered to be more susceptible to development in comparison to ordinary, cultivated or forested / developed landscapes where perceptions of 'wildness' are less tangible. Landscapes which are either remote or appear natural may vary in their susceptibility to development; and
- **Landscape Context and Adjacent Landscapes:** The extent to which the Proposed Works will influence landscape receptors across the Study Area relates to the associations that exist between the landscape receptor within which the Proposed Works is located and the landscape receptor from which the Proposed Works is experienced. In some situations, this association will be strong, where the landscapes are directly related. For example, adjacent areas of landscape character may share or 'borrow' a high number of common characteristics. Landscape elements may be linked to, or associated with, wider landscape patterns such as individual trees forming part of an avenue or pattern of woodland corpses, for example. In other situations, the association between adjacent landscapes will be weak. The context and visual connection to areas of adjacent landscape character or designations has a bearing on the susceptibility to development.

Landscape Sensitivity Rating

14.3.10 An overall sensitivity assessment of the landscape receptor is made by combining the assessment of the value of the landscape character receptor and its susceptibility to change. The evaluation of landscape sensitivity is described as 'High', 'Medium' or 'Low' and is drawn from the consideration of a range of criteria that indicate landscape value and susceptibility. The basis for the assessment is made clear using evidence and professional judgement in the evaluation of sensitivity for each receptor.

14.3.11 Criteria that tend towards higher or lower sensitivity are set out in **Table 14A.1**

Table 14A.1 Landscape Sensitivity to Change

Value / Susceptibility criteria	High ⟷ Level of value/susceptibility ranging from 'High' to 'Medium' to 'Low' ⟷ Medium ⟷ Low	
Designation	Designated landscapes / elements with national policy level protection or defined for their natural beauty. Evidence that the landscape / element is valued or used substantially for recreational activity.	Landscapes without formal designation. Despoiled or degraded landscape with little or no evidence of being valued by the community. Elements that are uncharacteristic such as non-natives or self-seeded vegetation that may need to be cleared.
Quality	Higher quality landscapes / elements with consistent, intact and well-defined, distinctive attributes.	Lower quality and indistinct landscapes / elements or features that detract from its inherent attributes.
Rarity	Rare or unique landscape character types, features or elements.	Widespread or 'common' landscape character types, features or elements.
Aesthetic / scenic	Aesthetic / scenic or perceptual aspects of designated wildlife, ecological or cultural heritage features that contribute to landscape character.	Limited wildlife, ecological or cultural heritage features, or limited contribution to landscape character.
Perceptual qualities	Landscape with perceptual qualities of wildness, remoteness or tranquillity.	Limited or no evidence that the landscape is used for recreational activity.
Cultural associations	Landscape with strong cultural associations that contributes to scenic quality.	Landscape with few cultural associations.
Susceptibility to change	Higher	Lower
Strength and robustness	Fragile landscape vulnerable and lacking the ability to accommodate change.	Robust landscape, able to accommodate change or loss of features without undue adverse effects.
Landscape Scale	A landscape of a suitably large enough scale to accommodate the development.	A smaller scale landscape that may require further engineering to accommodate the development.
Openness / Enclosure	An open landscape with limited screening or potential may be of higher susceptibility to the Proposed Works.	An enclosed landscape with screening or potential for mitigation may be of lower susceptibility to the Proposed Works.
Reinstatement	Lower value, non-characteristic landcover and elements capable of rapid reinstatement.	Higher value, characteristic landcover and elements that cannot be easily reinstated or replaced.
Skyline	Distinctive undeveloped skylines with landmark features.	Developed, nondistinctive skylines.
Association	Weak and indirect association. Other development may be of a smaller scale or historic.	Strong or direct association other similar contemporary developments / landscape character.

Value / Susceptibility criteria	High ⟷ Level of value/susceptibility ranging from 'High' to 'Medium' to 'Low' ⟷ Low	
Rationale	Strong landscape rationale and opportunity with high degree of design quality and / or embedded environmental measures.	Landscape with numerous environmental and technical constraints with lower design quality and / or embedded environmental measures.
Perceptual Qualities	Perceptual qualities associated with particular scenic qualities, wildness or tranquillity.	Contemporary, cultivated / settled or developed landscapes are likely to have a lower susceptibility.
Landscape Context	Adjacent landscape character context connected by borrowed character and views.	Host landscape character is separate from surrounding / adjacent landscape character.
Sensitivity to change	**Sensitivity drawn from consideration of the Value and Susceptibility criteria with the final conclusion on the level of Sensitivity ranging from 'High' to 'Medium' to 'Low'.**	

Landscape magnitude of change

14.3.12 The magnitude of change affecting landscape receptors is an expression of the scale of change that would result from the Proposed Works. In assessing the magnitude of change the assessment has focused on the size or scale of change and its geographical extent. The duration and reversibility are stated separately in relation to the assessed effects (i.e. as short / medium / long-term and temporary or permanent).

Size or scale of change

14.3.13 This criterion relates to the size or scale of change to the landscape that would arise as a result of the Proposed Works, based on the following factors:

- **Landscape Elements:** The degree to which the landscape elements or pattern of elements that makes up the landscape character would be altered by the Proposed Works through the loss, alteration or addition of elements in the landscape. The magnitude of change would generally be higher if the features that make up the landscape character are extensively removed or altered, and / or if many new components are added to the landscape;
- **Landscape Characteristics:** The extent to which the effect of the Proposed Works change (physically or perceptually) the key characteristics of the landscape which may be important to its distinctive character. This may include, for example, the scale of the landform, its relative simplicity, complexity or irregularity, the nature of the landscape context, the grain or orientation of the landscape, the degree to which the receptor is influenced by external features and the juxtaposition of the Proposed Works in relation to these key characteristics;
- **Landscape Character / Designation:** The degree to which landscape character receptors would be changed by the Proposed Works. If the Proposed Works is located in a landscape receptor that is already affected by other similar development, this may reduce the magnitude of change if there is a high level of integration and the developments form a unified and cohesive feature in the landscape. In the case of designated landscapes, the degree of change is considered in light of the effects on

the special landscape qualities which underpin the designation and the effect on the integrity of the designation.

All landscapes change over time and much of that change is managed or planned. Often landscapes will have management objectives for 'protection' or 'accommodation' of development. The scale of change may be localised, or occurring over parts of an area, or more widespread affecting whole landscape character areas and their overall integrity. Developmental change may be time limited or permanent; and

- **Distance:** The size and scale of change is also strongly influenced by the proximity of the Proposed Works to the receptor and the extent to which the Proposed Works can be seen as a characterising influence on the landscape. Consequently, the scale or magnitude of change is likely to be lower in respect of landscape receptors that are distant from the Proposed Works and / or screened by intervening landform, vegetation and built form to the extent that the scale of their influence on landscape receptors is small or limited. Conversely, landscapes closest to the Proposed Works are likely to be most affected. Host landscapes (where the Proposed Works is located within a 'host' landscape character unit) would be directly affected whilst adjacent areas of landscape character would be indirectly affected.

Geographical extent

14.3.14 Landscape effects are described in terms of the geographical extent or physical area that would be affected (described as a linear or area measurement). This should not be confused with the scale of the development or its physical footprint. The manner in which the geographical extent of the landscape effect is described for different landscape receptors is explained as follows:

- **Landscape Elements:** The geographical extent of landscape elements may be objectively measured in terms of numbers, area or linear measurement. For example, the number of trees, area of woodland and / or length of hedgerow affected may be recorded;
- **Landscape Character / Characteristics:** The extent of the effects on landscape character will vary depending on the specific nature of the Proposed Works. This is not simply an expression of visibility or the extent of the ZTV. It is a specific assessment of the extent of landscape character that would be changed by the Proposed Works in terms of its character, key characteristics and elements; and
- **Landscape Designations:** In the case of a designated landscape, this refers to the extent that the special landscape qualities of the designation are affected and whether this can be defined in terms of area or linear measurements, or subjectively (with the support of panel and / or peer review) and whether the integrity of the designation is affected.

Duration and reversibility

14.3.15 The duration and reversibility of landscape effects is based on the period over which the Proposed Works would occur. Long-term, medium-term and short-term landscape effects are defined as follows:

- Temporary / Reversible Development: This includes time limited elements and activities:
  - Long-term – more than 10 years;
  - Medium-term – 6 to 10 years; and
  - Short-term – 1 to 5 years.

Landscape magnitude of change rating

14.3.16 The 'magnitude' or 'degree of change' resulting from the Proposed Works is described as 'High', 'Medium', 'Low', 'Very Low' or 'Zero'. In assessing the magnitude of change, the assessment has focused on the size or scale of change and its geographical extent. The duration and reversibility are stated separately in relation to the assessed effects (i.e. as short / medium / long-term and temporary or permanent). The basis for the assessment of magnitude for each receptor is made clear using evidence and professional judgement.

14.3.17 The levels of magnitude of change that can occur are defined in **Table 14A.2.**

Table 14A.2 Landscape magnitude of change ratings

Magnitude of landscape change	Examples of Landscape Magnitude
High	Size / Scale: A large-scale change and major loss of key landscape elements / characteristics or the addition of large scale or numerous new and uncharacteristic features or elements that would affect the landscape character and the special landscape qualities / integrity of a landscape designation. Directly affecting a host landscape receptor or indirectly affecting a nearby receptor. Geographical extent: The size or scale of change would typically, but not always affect a large geographical extent or area and may be close to the Proposed Works.
High to medium	Intermediate rating with combination of criteria from high or medium magnitude.
Medium	Size / Scale: A medium scale change and moderate loss of some key landscape elements / characteristics or the addition of some new medium scale uncharacteristic features or elements that could partially affect the landscape character and the special landscape qualities / integrity of a landscape designation. Directly affecting a host landscape receptor or indirectly affecting a nearby receptor. Geographical extent: The size or scale of landscape change would typically, but not always affect a more localised geographical extent at an intermediate distance from the Proposed Works.
Medium to low	Intermediate rating with combination of criteria from medium or low magnitude.

Magnitude of landscape change	Examples of Landscape Magnitude
Low	Size / Scale: A small-scale change and minor loss of a few landscape elements / non key characteristics, or the addition of some new small-scale features or elements of limited characterising influence on landscape character / designations. Geographical extent: There may be a small partial change in landscape character, typically, but not always affecting a localised geographical extent at some distance from the Proposed Works.
Very Low	Size / Scale: A very small-scale change that may include the loss or addition of some landscape elements of limited characterising influence. The landscape characteristics and character would be unaffected. Geographical extent: Typically affecting a very small geographical extent at greater distance from the Proposed Works.

Evaluating landscape effects and significance

14.3.18 The level of landscape effect is evaluated through the combination of landscape sensitivity and magnitude of change. Once the level of effect has been assessed, a judgement is then made as to whether the level of effect is 'significant' or 'not significant'. This process is assisted by the matrix illustrated in **Table 14A.5** which is used to guide the assessment.

14.3.19 Further information is also provided about the nature of the effects (whether these would be direct / indirect; temporary / permanent / reversible; beneficial / neutral / adverse or cumulative).

Significant Landscape Effects

14.3.20 A significant effect would occur where the combination of the variables results in a defining effect on the landscape receptor due to the Proposed Works, or where changes of a lower magnitude affect a landscape receptor that is of particularly high sensitivity. A major loss or irreversible effect over an extensive area or landscape character, affecting landscape elements, characteristics and / or perceptual aspects that are key to a nationally valued landscape are likely to be significant.

Non-Significant Landscape Effects

14.3.21 A non-significant effect would occur where the effect of the Proposed Works is not defining, and the landscape character of the receptor continues to be characterised principally by its baseline characteristics. Equally, a small-scale change experienced by a receptor of high sensitivity may not significantly affect the special landscape quality or integrity of a designation. Reversible effects on elements, characteristics and character that are of small-scale or affecting lower value receptors are unlikely to be significant.

14A.4 Assessing visual effects

14.4.1 Visual Effects are concerned wholly with the effect of the development on views and the general visual amenity and are defined by the Landscape Institute in GLVIA 3[1], paragraphs 6.1 as follows:

- "*An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity. The concern ... is with assessing how the surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views*."

14.4.2 Visual effects are identified for different receptors (people) who would experience the view at their place of residence, within their community, during recreational activities, at work, or when travelling through the area. The visual effects include:

- a change to an existing static view, sequential views, or wider visual amenity as a result of development or the loss of particular landscape elements or features already present in the view.

14.4.3 The level of visual effect (and whether this is significant) is determined through consideration of the sensitivity of each visual receptor (or range of sensitivities for receptor groups) and the magnitude of change that would be brought about under the different phases of the Proposed Works.

Zone of Theoretical Visibility (ZTV)

14.4.4 Plans mapping the Zone of Theoretical Visibility (ZTV) are used to analyse the extent of theoretical visibility of all or part of the Proposed Works across the Study Area and to assist with viewpoint selection. The ZTV does not, however, take account of the screening effects of buildings, localised landform and vegetation unless specifically noted (see individual figures). As a result, there may be roads, tracks and footpaths within the Study Area which, although shown as falling within the ZTV, are screened or filtered by built form and vegetation which would otherwise preclude visibility.

14.4.5 The ZTVs provide a starting point in the assessment process and accordingly tend towards giving a 'worst-case' or greatest calculation of the theoretical visibility.

Viewpoint analysis

14.4.6 Viewpoint analysis is used to assist the assessment and is conducted from selected viewpoints within the Study Area. The purpose of this is to assess both the level of visual effect for particular receptors and to help guide the design process and focus the assessment. A range of viewpoints are examined in detail and analysed to determine whether a significant visual effect would occur. By arranging the viewpoints in order of distance it is possible to define a threshold or outer geographical limit, beyond which significant effects would be unlikely.

14.4.7 The assessment involves visiting the viewpoint location and viewing photographs prepared for each viewpoint location. The fieldwork is conducted in periods of fine weather with good visibility and considers seasonal changes such as reduced leaf cover or hedgerow maintenance.

14.4.8 The LVIA therefore includes viewpoint analysis prepared for each viewpoint and presented as supporting evidence in **Section 14.10.** A summary table of the findings is also provided in order of distance from the Proposed Works. This summary table assists in defining the direction, elevation, geographical spread and nature of the potential visual effects and identify areas where significant effects are likely to occur. This approach seeks to provide clarity and confidence to consultees and decision makers by allowing the detailed judgements on the magnitude of visual change to be more readily scrutinised and understood.

Evaluating visual sensitivity to change

14.4.9 In accordance with paragraphs 6.31-6.37 of GLVIA 3[1], the sensitivity of visual receptors is determined by a combination of the value of the view and the susceptibility of the visual receptors to the change likely to result from the Proposed Works on the view and visual amenity.

View / Visual Amenity Value

14.4.10 The value of a view or series of views reflects the recognition and importance attached either formally through identification on mapping or being subject to planning designations, or informally through the value which society attaches to the view(s). The value of a view is classified as high, medium or low and the basis for this assessment is made clear using evidence and professional judgement, based on the following criteria:

- **Formal recognition:** The value of views can be formally recognised through their identification on OS or tourist maps as formal viewpoints, sign-posted and with facilities provided to add to the enjoyment of the viewpoint such as parking, seating and interpretation boards. Specific views may be afforded protection in local planning policy and recognised as valued views. Specific views can also be cited as being of importance in relation to landscape or heritage planning designations, for example the value of a view would be increased if it presents an important vista from a designed landscape or lies within / overlooks a designated area which implies a greater value to the visible landscape; and
- **Informal recognition**: Views that are well-known at a local level and / or have particular scenic qualities can have an increased value, even if there is no formal recognition or designation. Views or viewpoints are sometimes informally recognised through references in art or literature and this can also add to their value. A viewpoint that is visited and appreciated by a large number of people would generally have greater importance than one gained by very few people.

Susceptibility to Change

14.4.11 Susceptibility relates to the nature of the viewer experiencing the view and how susceptible they are to the potential effects of the Proposed Works. A judgement to determine the level of susceptibility therefore relates to the nature of the viewer and their experience from that particular viewpoint or series of viewpoints, classified as high, medium or low and based on the following criteria:

- **Nature of the viewer:** The nature of the viewer is defined by the occupation or activity of the viewer at the viewpoint or series of viewpoints. The most common groups of viewers considered in the visual assessment include residents, motorists, and people taking part in recreational activity or working. Viewers—whose attention is focused on the landscape or with static long-term views—are likely to have a higher sensitivity. Viewers travelling in cars or on trains would tend to have a lower sensitivity as their view is transient and moving. The least sensitive viewers are usually people at their place of work as they are generally less sensitive to changes in views.
- **Experience of the viewer:** The experience of the visual receptor relates to the extent to which the viewer's attention or interest may be focused on the view and the visual amenity they experience at a particular location. The susceptibility of the viewer to change that arises from the Proposed Works may be influenced by the viewer's attention or interest in the view, which may be focused in a particular direction, from a static or transitory position, over a long or short duration, and with high or low clarity. For example, if the principal outlook from a settlement is aligned directly towards the Proposed Works, the experience of the visual receptor would be altered more notably than if the experience relates to a glimpsed view seen at an oblique angle from a car travelling at high speed. The visual amenity experienced by the viewer varies depending on the presence and relationship of visible elements, features or patterns experienced in the view and the degree to which the landscape in the view may accommodate the influence of the Proposed Works.

Visual Sensitivity Rating

14.4.12 An overall level of sensitivity is applied for each visual receptor or view, classified as 'High', 'Medium' or 'Low' by combining individual assessments of the value of the view and the susceptibility of the visual receptor to change. Each visual receptor, meaning the particular person or group of people likely to be affected at a specific viewpoint, is assessed in terms of their sensitivity. The basis for the assessments is made clear using evidence and professional judgement in the evaluation of each receptor. Criteria that tend towards higher or lower sensitivity are set out in **Table 14A.3**.

Table 14A.3 Visual sensitivity to change

Value / Susceptibility criteria	**Level of value / susceptibility ranging from 'High' to 'Medium' to 'Low'** **High ⟷ Medium ⟷ Low**	
Value – Landscape Value is determined by a range of indicators/criteria with examples as follows:		
Map/tourist information	Specific viewpoint identified in OS maps and/or tourist information and signage.	Viewpoint not identified in OS maps or tourist information and signage.
Facilities	Facilities provided at viewpoint to aid the enjoyment of the view.	No facilities provided at viewpoint to aid enjoyment of the view.

Planning recognition	View afforded protection in planning policy.	View is not afforded protection in planning policy.
Landscape value	View is within or overlooks a designated landscape, which implies a higher value to the visible landscape.	View is not within, nor does it overlook, a designated landscape.
Recognition	View has informal recognition and well-known at a local level, as having particular scenic qualities.	View has no informal recognition and is not known as having particular scenic qualities.
Art/Literature	View or viewpoint is recognised through references in art or literature.	View or viewpoint is not recognised in references in art or literature.
Scenic Quality	View has high scenic qualities relating to the content and composition of the visible landscape.	View has low scenic qualities relating to the content and composition of the visible landscape.
Susceptibility – determined by a range of indicators / criteria with examples as follows:		
Activity of the viewer	Viewer who is likely or liable to be influenced by the Proposed Works such as residents, walkers, or tourists, whose main attention and interest may be on their surroundings.	Viewer who is un or less likely to be influenced by the Proposed Works such as viewers whose attention is not focused on their surroundings (e.g. people at work, or team sports).
Nature of the View	Residents that gain static, long-term views of the development in their principal outlook.	Mobile viewers whose views are transient and dynamic (e.g. travelling in cars or on trains with glimpsed views).
Direction/ Field of View	A view that is focused in a specific directional vista, with notable features of interest in a particular part of the view.	Open views with no specific point of interest.
Visual amenity	Viewers are focused on the experience of a high level of visual amenity at the location due to its overall pleasantness as an attractive visual setting or backdrop to activities.	The visual amenity experienced at the location by viewers is less pleasant or attractive than might otherwise be the case.
Sensitivity to change	**Sensitivity drawn from consideration of the Value and Susceptibility criteria to level of Sensitivity ranging from 'High' to 'Medium' to 'Low'.**	

Visual magnitude of change

14.4.13 The visual magnitude of change is an expression of the scale of change that would result from the visibility of the Proposed Works. In assessing the magnitude of change, the assessment has focused on the size or scale of change and its geographical extent. The duration and reversibility are stated separately in relation to the assessed effects (i.e. as short / medium / long-term and temporary / permanent).

Size or Scale of Change

14.4.14 An assessment is made of the size or scale of change in the view that is likely to be experienced as a result of the Proposed Works, based on the following criteria:

- **Distance:** the distance between the visual receptor / viewpoint and the Proposed Works. Generally, the greater the distance, the lower the magnitude of change as the Proposed Works would constitute a smaller-scale component of the view.
- **Size:** the amount and size of the Proposed Works that would be seen. Visibility may range from a small / partial to whole visibility of the Proposed Works

  This is also related to the degree to which development may be wholly or partly screened by landform, vegetation (seasonal) and / or built form. Conversely, open views are likely to reveal more of a development, particularly where this is a key characteristic of the landscape.
- **Scale:** the scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition. The scale of the Proposed Works may appear larger or smaller relative to the scale of the receiving landscape.
- **Field of View:** the vertical / horizontal field of view (FoV) and the proportion of view that is affected by the Proposed Works. Generally, the more of the proportion of a view that is affected, the higher the magnitude of change would be. If the Proposed Works extends across the whole of an open outlook, the magnitude of change would generally be higher as the full view would be affected. Conversely, if the Proposed Works extends over a narrow part of an open view, the magnitude of change is likely to be reduced as the Proposed Works would not affect the whole view or outlook. This can in part be described objectively by reference to the horizontal / vertical FoV affected relative to the extent and proportion of the available view.
- **Contrast:** the character and context within which the Proposed Works would be seen and the degree of contrast or integration of any new features with existing landscape elements, in terms of scale, form, mass, line, height, colour, luminance and motion. Developments which contrast or appear incongruous in terms of colour, scale and form are likely to be more visible and have a higher magnitude of change.
- **Consistency of image:** the consistency of image of the Proposed Works in relation to other developments. The magnitude of change for the Proposed Works is likely to be lower if it appears broadly similar to other developments in the landscape in terms of its scale, form and general appearance. New development is more likely to appear as logical components of the landscape with a strong rationale for their location.
- **Skyline / Background:** whether the Proposed Works would be viewed against the skyline or a background landscape may affect the level of contrast and magnitude. For example, skyline developments may appear more noticeable, particularly where they affect open and uninterrupted or undeveloped horizons. Conversely, development may also appear more noticeable when viewed against a darker background landscape, such as forestry. In these cases, the magnitude of change would tend to be higher. If the Proposed Works adds to an already developed skyline the magnitude of change would tend to be lower.
- **Number:** Generally, the greater the number of separate development components seen simultaneously or sequentially, the higher the magnitude of change and this may lead to whole project effects. Further cumulative effects would occur in the case of separate, existing developments, and their spatial relationship to each other would affect the magnitude of change.

- **Nature of Visibility:** The Proposed Works may be subject to various phases of development change and the manner in which the development may be viewed could be intermittent or continuous and / or seasonal due to periodic management or leaf fall, for example.

Geographical Extent

14.4.15 The geographic extent over which the visual effects would be experienced is also assessed. This is distinct from the size or scale of effect and is described in terms of the physical area or location over which it would be experienced (described as a linear or area measurement). The extent of the effects would vary according to the specific nature of the Proposed Works and is principally assessed through ZTV, field survey and viewpoint analysis of the extent of visibility likely to be experienced by visual receptors. The geographical extent of visual effects is described as in the following examples:

- The geographical extent can be described as an area measurement or proportion of the total receptor affected. For example, effects on people within a particular area such as a golf course or area of common land can be illustrated via a 'representative viewpoint' that represents a similar visual effect, likely to be experienced by larger numbers of people within that area. The geographical extent of that visual effect can be expressed as approximately '5 hectares' or '10%' of the common land or a golf course area;
- The geographical extent can be described as a linear measurement (m or km) according to the length of route affected. For example, effects on people travelling on a route through the landscape such as a road or footpath can be illustrated via a 'representative viewpoint' that represents a similar visual effect likely to be experienced by larger numbers of people along that route. The geographical extent of that visual effect can be expressed as approximately '2 km' or '10%' of the total length of the route; and
- The geographical extent of a visual effect experienced from a specific viewpoint may be limited to that location alone. (An example of a 'specific viewpoint' is a public viewpoint recommended in tourist literature such as a well visited hill summit. An example of an 'illustrative viewpoint' is a particular location within a built up or well vegetated area where an uncharacteristically open view exists).

Duration and Reversibility

14.4.16 The duration and reversibility of visual effects is based on the period over which the Proposed Works would occur (during decommissioning) and the effects reversed at the end of that period. Long-term, medium-term and short-term landscape effects are defined as follows:

- Temporary / Reversible Development: This includes time limited elements and activities:
  - Long-term – more than 10 years;
  - Medium-term – 6 to 10 years; and
  - Short-term – 1 to 5 years.

Visual magnitude of change rating

14.4.17 The 'magnitude' or 'degree of change' resulting from the Proposed Works is described as 'High', 'Medium', 'Low', 'Very Low' or 'Zero'. In assessing the magnitude of change the assessment has focused on the size or scale of change and its geographical extent. The duration and reversibility are stated separately in relation to the assessed effects (i.e. as short / medium / long-term and temporary / permanent). The basis for the assessment of magnitude for each receptor is made clear using evidence and professional judgement and some examples of the levels of magnitude of change that can occur on views are defined in **Table 14A.4**.

Table 14A.4 Visual magnitude of change

Magnitude of landscape change	Examples of Visual Magnitude	
High	Size and Scale: Number: Distance: FoV: Nature of Visibility: Contrast: Skyline: Consistency of Image:	A very large - large and dominant change to the view. Involving the loss/addition of a large number of features / elements. Typically appearing closer to the viewer in the fore to mid-ground. Affecting a large vertical and wide horizontal FoV. Multiple phase development, continuously and sequentially visible. Strong degree of contrast with surroundings, little / no screening. Visible on the skyline as a new feature. Contrasting with other existing developments, lacking in visual rationale. Typically experienced from representative viewpoints illustrating a visual effect likely to be experienced by larger numbers of people, relative to the activity, affecting a large area or length / proportion of route. May also be experienced from a specific viewpoint.
High to medium	Intermediate rating with combination of criteria from high or medium magnitude of change category.	
Medium	Size and Scale: Number: Distance: FoV: Nature of Visibility: Contrast: Skyline: Consistency of Image:	A medium and prominent change to the view. Involving the loss/addition of a number of features / elements. Typically appearing in the middle ground. Affecting a medium vertical and a medium horizontal FoV. Multiple phase development, intermittently and sequentially visible. Contrast with surroundings and may benefit from some screening. Visible on the skyline along with other features. Different from other existing developments, some visual rationale. Typically experienced from representative viewpoints illustrating a visual effect likely to be experienced by a medium number of people, relative to the activity, affecting a medium area or length / proportion of route. May also be experienced from a specific viewpoint.
Medium to low	Intermediate rating with combination of criteria from medium or low magnitude of change category.	
Low	Size and Scale: Number: Distance: FoV: Nature of Visibility:	A small / noticeable change, easily missed by the casual observer. Involving the loss/addition of a small number of features / elements. Typically appearing in the background. Affecting a small vertical and a narrow horizontal FoV. Simple, single development, intermittently and infrequently visible.

Magnitude of landscape change	Examples of Visual Magnitude	
	Contrast: Skyline: Consistency of Image:	Some parity / 'fits' with surroundings and some screening. Partly visible on a developed skyline or not visible on the skyline. Similar from other existing developments with visual rationale, appearing reasonably well accommodated within its surroundings. Typically experienced from illustrative viewpoints likely to be experienced by low numbers of people, relative to the activity, affecting a smaller area or length / proportion of route. May also be experienced from a specific viewpoint.
Very Low to Zero	Size and Scale: Number: Distance: FoV: Nature of Visibility: Contrast: Skyline: Consistency of Image:	A small or negligible change, need to 'look for it'. Involving the loss/addition of a small number of features / elements. Typically appearing in the far distance. Affecting a small vertical and a very narrow horizontal FoV. Simple, single development, intermittently and infrequently visible. Blends with surroundings and / or is well screened. Partly visible on a developed skyline or not visible on the skyline. Similar from other existing developments with strong visual rationale, appearing well accommodated within its surroundings. Typically experienced from illustrative viewpoints likely to be experienced by low numbers of people, relative to the activity, affecting a smaller area or length / proportion of route. May also be experienced from a specific viewpoint.

Evaluating visual effects and significance

14.4.18 The level of visual effect is evaluated through the combination of visual sensitivity and magnitude of change. Once the level of effect has been assessed, a judgement is then made as to whether the level of effect is 'significant' or 'not significant'. This process is assisted by the matrix illustrated in **Table 14A.5** which is used to guide the assessment.

14.4.19 Further information is also provided about the nature of the effects (whether these would be direct / indirect; temporary / permanent / reversible; beneficial / neutral / adverse or cumulative).

14.4.20 Significant Visual EffectsA significant effect is more likely to occur where a combination of the variables results in the Proposed Works having a defining effect on the view or visual amenity or where changes affect a visual receptor that is of high sensitivity.

Non-Significant Visual Effects

14.4.21 A non-significant effect is more likely to occur where a combination of the variables results in the Proposed Works having a non-defining effect on the view or visual amenity or where changes affect a visual receptor that is of low sensitivity.

Weather conditions

14.4.22 The assessment of visual effects is undertaken in clear weather with good to excellent visibility. This means that the viewpoint assessment represents a maximum or fair assessment of the likely visual effects. The same viewpoint may be experienced under less optimal viewing conditions resulting in a significant effect appearing as non-significant, due to the change in the variable weather conditions. Due to the conditions of the assessment, the reverse (a non-significant effect appearing as significant) is unlikely to occur.

14A.5 Assessing cumulative landscape and visual effects

14.5.1 The assessment of cumulative effects is essentially the same as for the main assessment of the 'solus' or primary landscape and visual effects, in that the level of landscape and visual effect is determined by assessing the sensitivity of the landscape or visual receptor and the magnitude of change. Cumulative assessment, however, considers the magnitude of change posed by multiple development.

14.5.2 A cumulative landscape or visual effect simply means that more than one type of development is present or visible within the landscape. Other forms of existing development and land use such as woodland and forestry, patterns of agriculture, built form, and settlements already have a cumulative effect on the existing landscape that is already accepted or taken for granted. These features often contribute strongly to the existing character, forming a positive or adverse component of the local landscape. Landscapes, however will have a finite capacity for cumulative development, beyond which further new development would result in landscape character change.

14.5.3 This assessment has adopted detailed guidance on the cumulative assessment of wind farm development is provided in the Scottish Natural Heritage document *'Guidance: Assessing the Cumulative Landscape and Visual Impact of Onshore Wind Energy Developments'* (2021). This distinguishes between 'additional' cumulative effects that would result from adding the Proposed Works to other cumulative development and 'combined' cumulative effects that assess the total cumulative effect of the Proposed Works and other cumulative development. This. In the latter case a significant cumulative effect may result from the Proposed Works or one of more other existing, under-construction or consented developments, or other development applications. In those cases, the main contributing development(s) is identified in the assessment.

14.5.4 Types of cumulative effect are defined as follows:

- Cumulative Landscape Effects: Where more than development may have an effect on a landscape designation or particular area of landscape character;
- Cumulative Visual Effects: the cumulative or incremental visibility of similar types of development that may combine to have a cumulative visual effect. These can be further defined as follows:
  - Simultaneous or combined: where two or more developments may be viewed from a single fixed viewpoint simultaneously, within the viewer's field of view and without requiring them to turn their head[2];
  - Successive or repetitive: where two or more developments may be viewed from a single viewpoint successively as the viewer turns their head or swivels through 360°; and

[2] Note: A person's field of view is variable but is approximately 90° when facing in one direction.

- Sequential: where a number of developments may be viewed sequentially or repeatedly at increased frequency, from a range of locations when travelling along a route within the LVIA Study Area.

14.5.5 Whilst the CLVIA considers other development, it should not be considered as a substitute for individual LVIA assessment in respect of each of the other cumulative developments included in the CLVIA.

Defining the cumulative study area

14.5.6 The cumulative Study Area is the same as the initial 5 km LVIA Study Area as illustrated in **Figure 14.6**. The cumulative assessment considers the effects of other existing, under-construction, consented and application developments within a wider search area (up to 5km radius from the Works Area) and assesses the effects of these on the landscape and visual receptors within the LVIA Study Area.

14.5.7 Those developments at pre-planning or scoping stage are excluded in accordance with Scottish Natural Heritage guidance unless there is a justified / exceptional circumstance for their inclusion in the assessment.

14.5.8 Assessment of cumulative effects during the Final Site Clearance phase have not been assessed since this phase would occur in approximately 90 – 100 years time. It is not possible to predict potential cumulative development or changes to existing / proposed developments across this time period.

Predicting cumulative landscape effects

14.5.9 The assessment considers the extent to which the Proposed Works, in combination with others, may change landscape character through either an ‘additional’ or ‘in combination’ effect on characteristic elements, landscape characteristics and quality of the baseline landscape character. Identified cumulative landscape or seascape effects are described in relation to each individual Landscape Character Type/Coastal Character Area and for any designated landscape areas assessed within the LVIA Study Area.

Predicting cumulative visual effects

14.5.10 The cumulative visibility of other existing and consented developments and applications is established using the computer programme (Resoft Wind Farm© software) to identify areas where developments are theoretically visible. In addition, publicly accessible LVIA analysis from consented or application developments is also interrogated to inform the assessment where this information is available.

14.5.11 With potential receptor locations identified, cumulative effects on individual receptor groups are then explored through viewpoint analysis, which involves site visits informed by wireline illustrations that include other developments. The computer programme itself can also be used to ‘drive’ particular routes to assess the visibility of different developments and inform the assessment of sequential cumulative effects that may occur along a route or journey, and compared to actual visibility experienced along a route on Site.

Evaluation of cumulative landscape and visual effects

14.5.12 The evaluation of cumulative effects is assisted by the matrix illustrated in **Table 14A.5,** which is used to guide the assessment.

14.5.13 The cumulative assessment has been prepared to ensure that, as well as the 'solus' or primary effect of the Proposed Works (LVIA) the 'additional' cumulative effects and the 'combined' cumulative effect (CLVIA) is also reported to account for two cumulative Scenarios as follows:

- **Proposed Works:** Assessed on an individual basis (the LVIA). This part of the assessment may take account of other existing forms of development that may be present in the landscape, whilst recognising that their influence on landscape character is likely to be time limited. It does not consider the additional or combined cumulative effects and only reports of the effect of the Proposed Works alone;
- **Scenario 1: Existing + Consented + the Proposed Works**: The additional and combined cumulative effects of the existing and consented developments with the Proposed Works are assessed; and
- **Scenario 2: Existing + Consented + Applications + the Proposed Works**: The additional and combined cumulative effects of the existing and consented developments and applications, with the Proposed Works are assessed.

14.5.14 In addition, the cumulative assessment takes account of the timescales, as far as practicable, for the operation of the existing and consented developments within 5 km of the Proposed Works.

14.5.15 Due to the numbers of other development involved, the overall cumulative effects may be greater than for the primary effect or additional effect for the Proposed Works assessed in the main LVIA. The resulting level of cumulative effect may remain at the same level of effect or increase to a higher level of effect. The point at which these effects become significant or not significant in landscape and visual terms is still a matter for professional judgement, although four scenarios or combinations of cumulative effect, taking account of other development can occur as follows:

- A significant effect from the Proposed Works is predicted in addition or combination with another significant effect attributed to other development(s). The effect is still termed significant and cumulative, but is a greater level of effect than for either development individually;
- A significant effect from the Proposed Works is predicted in addition or combination with another non-significant effect attributed to other development(s). The effect is still termed significant and cumulative, but is attributed to the Proposed Works and is a greater level of effect than for either development individually;
- A non-significant effect from the Proposed Works is predicted in addition or combination with another significant effect attributed to other development(s). The effect is still termed significant and cumulative, but is attributed to the other development(s) and is a greater level of effect than for either development individually; and
- A non-significant effect from the Proposed Works is predicted in addition or combination with another non-significant effect attributed to other development(s). The effect is still termed cumulative and is a greater level of effect than for either development individually; the combined effect however, may or may not be significant.

14.5.16 The nature of a cumulative effect may also be described as direct / indirect, temporary / permanent, or beneficial/ adverse. The probability of a cumulative effect occurring may also be described (certain, likely or uncertain / unknown).

Evaluation of significance

14.5.17 The matrix presented in **Table 14A.5** is used as a guide to illustrate the LVIA process. In line with the emphasis placed in GLVIA3[1] upon the application of professional judgement, an overly mechanistic reliance upon a matrix is avoided through the provision of clear and accessible narrative explanations of the rationale underlying the assessment made for each landscape and visual receptor. Such narrative assessments provide a level of detail over and above the outline assessment provided by use of the matrix alone.

14.5.18 The landscape and visual assessment unavoidably, involves a combination of quantitative and qualitative assessment and wherever possible cross references will be made to objective evidence, baseline figures and / or to photomontage visualisations to support the assessment conclusions. Often a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach. Importantly each effect results from its own unique set of circumstances and have been assessed on a case by case basis. The matrix should therefore be considered as a guide and any deviation from this guide will be clearly explained in the assessment.

14.5.19 In accordance with the relevant EIA Regulations it is important to determine whether the effects, assessed as a result of the Proposed Works, are likely to be significant. Significant landscape and visual effects will be highlighted in bold in the text and in most cases, relate to all those effects that result in a '**Major** or a '**Major / Moderate**' effect as indicated in **Table 14A.5**.

14.5.20 In some circumstances, '**Moderate**' levels of effect also have the potential, subject to the assessor's opinion, to be considered as significant and these exceptions are also highlighted in bold and explained as part of the assessment, where they occur.

14.5.21 White or un-shaded boxes in **Table 14A.5** indicate a non-significant effect. In those instances where there would be no effect, the magnitude has been recorded as 'Zero' and the level of effect as 'None'.

Table 14A.5 Evaluation of landscape and visual effects

		Landscape and Visual Sensitivity		
		High	**Medium**	**Low**
Magnitude of Change	**High**	**Major (Significant)**	**Major/Moderate (Significant)**	Moderate (Potentially Significant)
	Medium	**Major/Moderate (Significant)**	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)
	Low	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)	Minor (Not Significant)
	Very Low	Moderate/Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)
	Zero	None		

Type or Nature of Effect

14.5.22 In accordance with the EIA Regulations the type or nature of effect is also described in terms of whether it is direct or indirect; its duration (temporary / permanent or reversible) cumulative; and whether the effect is positive, neutral or negative. Transboundary effects are not relevant to this assessment.

Direct and indirect effects

14.5.23 Direct landscape effects relate to the host landscape and concern both physical and perceptual effects on the receptor.

14.5.24 Indirect landscape effects relate to those landscapes and receptors which are separated by distance or remote from the development and therefore are only affected in terms of perceptual effects. The Landscape Institute also defines indirect effects as those which are not a direct result of the development but are often produced away from it or as a result of a complex pathway.

14.5.25 Visual effects are generally all considered as direct effects. An indirect visual effect may however be used to define a visual effect on a view that is not in the direction of the main view of the viewer as described by the following examples:

- Road users generally face the road directly ahead in the direction of travel and visual effects affecting those views may be described as direct effects. Where the visual effect is experienced in views oblique to the direction of travel they may be described as indirect.
- Designed landscapes and vistas / viewpoints may be orientated in a particular direction and visual effects affecting those views may be described as direct effects. Where the visual effect is experienced in views oblique to the direction of the designed or main / primary view they may be described as indirect.

14.5.26 Secondary effects (or effects subsequent to an initial effect) are covered in this assessment by indirect effects.

Beneficial and adverse effects

14.5.27 Large developments give rise to a wide range of opinions, from strongly adverse to strongly beneficial. However, LVIA is not an assessment of public opinion, although a precautionary approach has been taken, which assumes that the nature of the effects would be adverse or neutral unless otherwise stated.

14.5.28 Guidance provided by the in GLVIA3[1] on the nature of effect (i.e. beneficial or adverse) states that 'in the LVIA, thought must be given to whether the likely significant landscape and visual effects are judged to be positive (beneficial) or negative (adverse) in their consequences for landscape or for views and visual amenity', but it does not provide guidance as to how that may be established in practice. The nature of effect is therefore one that requires interpretation and, where applied, this involves reasoned professional opinion.

14.5.29 In this assessment the nature of effects refers to whether the landscape and / or visual effect of the Proposed Works is positive or negative (herein referred to as 'beneficial' / 'neutral' or 'adverse').

14.5.30 In relation to many forms of development, the LVIA will identify 'beneficial' and 'adverse' effects by assessing these under the term 'Nature of Effect'. The landscape and visual effects of large-scale infrastructure are difficult to categorise in either of these brackets as, unlike other disciplines, there are no definitive criteria by which the effects can be measured as being categorically 'beneficial' or 'adverse'. In some disciplines, such as noise or ecology, it is possible to quantify the effect in numeric terms, by objectively identifying or quantifying the proportion of a receptor that is affected and assessing the nature of that effect in justifiable terms. However, this is not the case in relation to landscape and visual effects where the approach combines quantitative and qualitative assessment.

14.5.31 Generally, a precautionary approach is adopted, which assumes that significant landscape and visual effects will be weighed on the adverse side of the planning balance. Unless it is stated otherwise, the effects considered in the assessment will be considered to be adverse. Beneficial or neutral effects may, however, arise in certain situations and are stated in the assessment where relevant, based on the following definitions:

- Beneficial effects contribute to the landscape and visual resource through the enhancement of desirable characteristics or the introduction of new, beneficial attributes. The development contributes to the landscape by virtue of good design or the introduction of new landscape planting. The removal of undesirable existing elements or characteristics can also be beneficial, as can their replacement with more appropriate components.
- Neutral effects occur where the development fits with the existing landscape character or visual amenity. The development neither contributes to or detracts from the landscape and visual resource and can be accommodated with neither beneficial or adverse effects, or where the effects are so limited that the change is hardly noticeable. A change to the landscape and visual resource is not considered to be adverse simply because it constitutes an alteration to the existing situation.
- Adverse effects are those that detract from the landscape character or quality of visual attributes experienced, through the introduction of elements that contrast, in a detrimental way, with the existing characteristics of the landscape and visual resource, or through the removal of elements that are key in its characterisation.

Probability of Effect

14.5.32 The probability of cumulative effects is variable. Those effects related to existing development and those under construction are considered as certain; effects related to development with planning consent are considered as likely. Development sites for which there is a submitted planning application are considered as uncertain with an even greater level of uncertainty attached to pre-planning application sites.

14A.6 Production of ZTVs and visualisations

14.6.1 Zones of Theoretical Visibility (ZTVs) and visualisations (annotated photographs) are graphical images produced to assist and illustrate the LVIA. The methodology used for viewpoint photography, ZTVs and annotated photographs adopts the methods described in the Scottish Natural Heritage visualisation guidance[3]. Additional guidance is provided by the Landscape Institute[4].

Methodology for production of ZTVs

14.6.2 The ZTVs are calculated using Resoft Wind Farm© software to generate the zone of theoretical visibility of the Proposed Works. This software creates a 3D computer model of the existing landscape and the Proposed Works using digital terrain data as follows:

- Ordnance Survey (OS) Terrain 50: Used to produce the main or standard ZTV plot, these tiles provide a digital record of the existing landform of Great Britain, or Digital Terrain Model (DTM) at 10 m elevation intervals based on 50 m grid squares and models representing the specified geometry and position of the Safestore. The computer model includes the entire Study Area and takes account of the effects caused by atmospheric refraction and the Earth's curvature; and
- OS Terrain 5: Used to produce a more detailed ZTV plot for limited areas, often used where there are small undulations or crags within the landscape. These tiles provide a digital record of the existing landform of Great Britain based on 5 m grid squares and models representing the specified geometry and position of the Safestore. The computer model includes the central Study Area and takes account of atmospheric refraction and the Earth's curvature.

14.6.3 The resulting ZTV plots are overlaid on OS mapping at an appropriate scale and presented as figures using desktop publishing/graphic design software.

Methodology for baseline photography

14.6.4 Once a view has been selected, the location is visited, confirmed, and assessed in the field. The viewpoint location is micro-sited to avoid as far as reasonable foreground clutter and photographed during fair weather and light conditions. A photographic record is taken to record the view and the details of the viewpoint location and associated data are recorded to assist in the production of visualisations and to validate their accuracy.

14.6.5 The following photographic information is recorded:

- Date, time, weather conditions and visual range;
- GPS recorded 12 figure grid reference accurate to ~5-10 m;

[3] Scottish Natural Heritage (2017). Visual Representation of Wind Farms, Version 2.2.

[4] Landscape Institute (2019). Technical Guidance Note: Visual Representation of Development Proposals.

- GPS recorded Above Ordnance Datum (AOD) height data;
- The focal length of lens is confirmed;
- Horizontal field of view (in degrees); and
- Bearing to Target Site (Proposed Works).

14.6.6 All photographs included in this assessment were recorded with a digital SLR camera set to produce photographs equivalent to that of a manual 35 mm SLR camera with a fixed 50 mm or 75 mm focal length lens as required.

14.6.7 Whilst no two-dimensional image can fully represent the real viewing experience, the visualisation aims to provide a realistic representation of the Proposed Works, based on current information and visualisation methodology.

Weather Conditions

14.6.8 GLVIA 3[1] para 8.22 states:

"In preparing photomontages, weather conditions shown in the photographs should (with justification provided for the choice) be either:

- *representative of those generally prevailing in the area; or*
- *taken in good visibility, seeking to represent a maximum visibility scenario when the development may be highly visible".*

14.6.9 In preparing visualisations for the LVIA, photographs were taken in favourable weather conditions. Weather conditions shown in the photographs for all viewpoints have, where possible, been taken during periods of 'very good' or 'excellent' visibility conditions, seeking to represent a maximum visibility scenario when the Proposed Works may be highly visible.

Methodology for production of visualisations

14.6.10 Each view has been illustrated with an annotated baseline photograph indicating the Proposed Works. The photograph is of the existing view recorded in fair weather conditions and usually presented as a panorama that represents a 90° or 53.5° FoV photograph.

Baseline Photograph Production

14.6.11 Photographs are then taken using a digital SLR camera in combination with a panoramic head equipped tripod. Detailed information is then recorded on site to enable the accurate alignment of the photographs with the wireline model (data such as: GPS grid co-ordinates; ground level information; compass bearings; and any other known references and viewpoint information).

14.6.12 To create the baseline panorama, the photographs from the viewpoint are then digitally joined using Autopano Giga or PTGui software to form a planar or cylindrical projection image or panorama using computer software to remove 'barrel distortion' caused by the camera lens. There are practical limitations to shooting viewpoint photographs only in very good or excellent visibility and at particular times of day or from location that avoid foreground clutter or other vertical features such as telegraph poles, particularly where this is a true representation of the view from that viewpoint area.

Limitations of Visualisations

14.6.13 The visualisations used in this LVIA are for illustrative purposes only and, whilst useful tools in the assessment, are not considered to be completely representative of what will be apparent to the human eye. The assessments are carried out from observations in the field and therefore may include elements that are not visible in the photographs.

14.6.14 The visualisations of the Proposed Works have a number of limitations when using them to form a judgement on visual effect. These include:

- A visualisation can never show exactly what a development will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image;
- The images provided give a reasonable impression of the scale and the distance to the Proposed Works but can never be 100% accurate to the as constructed effect;
- A static image cannot convey movement or other features such as the movement of water or the reflection from the sun;
- The viewpoints illustrated are representative of views in the area but cannot represent visibility at all locations;
- To form the best impression of the effects, these images are best viewed at the viewpoint location shown;
- The visualisations must be printed and viewed at the correct size as indicated on the figures;
- Images should be held flat at a comfortable arm's length. If viewing these images on a wall or board at an exhibition, stand at arm's length from the image presented to gain the best impression; and
- It is preferable to view printed images rather than view images on screen. Images on screen should be viewed using a normal PC screen with the image enlarged to the full screen height to give a realistic impression.

Printing of maps and visualisations

14.6.15 All electronic visualisations and maps should be printed out and viewed at the correct scale as noted on the document.

Appendix 14B: Viewpoint Record Sheets

Appendix 14B
Viewpoint Record Sheets

Viewpoint 1: Ayrshire Coastal Path (approach from the east)		
Camera format: *Digital SLR*	Camera height: approx. *1.50m*	Lens focal length: *50mm (fixed)*
Date / Time: 04/03/2022 13:20	GPS: NS 18825, 52021 GPS Accuracy: ~4m	Weather / visibility: Sun / some cloud Very good (but looking into sun)
Description of Exact Location: Power Station Road as Hunterston B becomes fully visible on approach from the east (adjacent to Castle ruins on aerial view). On the footpath next to a road sign (40mph / No Stopping).		
Perceptual Qualities (remoteness/sounds/tranquillity): Some traffic, occasional walker - limited sense of remoteness or tranquillity.		
Landscape Condition: Pastural fields in good condition, coastline to the right beyond low stone wall in need of maintenance. No litter evident along road.		

Viewpoint 2: Ayrshire Coastal Path (approach from the west)		
Camera format: *Digital SLR*	Camera height: approx. *1.50m*	Lens focal length: *50mm (fixed)*
Date / Time: 04/03/2022 14:00	GPS: NS 18026, 51519 GPS Accuracy: ~4m	Weather / visibility: Sun / some cloud Very good
Description of Exact Location: South of main entrance / roundabout and opposite main car park. On the footpath where fencing comes to a 'point' following the curve in the road.		
Perceptual Qualities (remoteness/sounds/tranquillity): Some traffic, occasional staff – very limited sense of remoteness or tranquillity.		
Landscape Condition: Industrial setting but well-maintained buildings, although empty compounds adjacent to coastline away from main complex. Some litter caught in fences.		

Viewpoint 3: Goldenberry Hill		
Camera format: *Digital SLR*	Camera height: approx. *1.50m*	Lens focal length: *50mm (fixed)*
Date / Time: 04/03/2022 13:20	GPS: NS 18310, 50329 GPS Accuracy: ~4m	Weather / visibility: Sun / some cloud Very good
Description of Exact Location: At the cairn at the summit of Goldenberry Hill.		
Perceptual Qualities (remoteness/sounds/tranquillity): Workmen at adjacent communication tower - maritime activity visible and coastal settlements as well as nearby road, although some sense of remoteness and tranquillity.		
Landscape Condition: Natural rough grassland and scrub typical of uplands, but dilapidated stone walling near summit. No litter evident.		

Viewpoint 4: Core Path NC36 near Hunterston Castle		
Camera format: *Digital SLR*	Camera height: approx. *1.50m*	Lens focal length: *50mm (fixed)*
Date / Time: 04/03/2022 13:20	GPS: NS 19327, 51497 GPS Accuracy: ~5m	Weather / visibility: Sun / some cloud Very good
Description of Exact Location: Core Path in gap between the castle and the hedgerow.		
Perceptual Qualities (remoteness/sounds/tranquillity): Occasional cyclists and walkers on path, some activity at the castle. Some sense of remoteness and tranquillity.		
Landscape Condition: Well maintained garden grounds and fence lines.		

Viewpoint 5: A78 near junction with Kilrusken Toll		
Camera format: *Digital SLR*	Camera height: approx. *1.50m*	Lens focal length: *50mm (fixed)*
Date / Time: 23/03/2022 12:05	GPS: NS 20280, 50918 GPS Accuracy: ~4m	Weather / visibility: Sun - but haze preventing long distance views Good to average
Description of Exact Location: Adjacent to bollard to the north of the Kilrusken Toll junction.		
Perceptual Qualities (remoteness/sounds/tranquillity): Busy 'A' road with cars / lorries approaching and passing at speed - little sense of remoteness and tranquillity.		
Landscape Condition: Improved grassland / pastural fields, with some scrub at boundaries – generally in good condition. Maintained hedgerows and avenues of trees. Tall ruderal vegetation beyond roadside verge with some litter.		

Viewpoint 6: 'The Lion', Great Cumbrae		
Camera format: *Digital SLR*	Camera height: approx. *1.50m*	Lens focal length: *50mm (fixed)*
Date / Time: 04/03/2022 15:40	GPS: NS 17991, 54920 GPS Accuracy: ~4m	Weather / visibility: Sun / some cloud Very good
Description of Exact Location: Formal layby with interpretation board - next to interpretation board.		
Perceptual Qualities (remoteness/sounds/tranquillity): Occasional cars, cyclists, walkers on road, maritime activity although some sense of remoteness and tranquillity.		
Landscape Condition: Semi-natural coastline, some sign of ageing on interpretation board, broken glass, aging picnic benches.		

Viewpoint 7: Millport, Great Cumbrae		
Camera format: *Digital SLR*	Camera height: approx. *1.50m*	Lens focal length: *50mm (fixed)*
Date / Time: 04/03/2022 15:20	GPS: NS 16535, 54978 GPS Accuracy: ~4m	Weather / visibility: Sun / some cloud Very good
Description of Exact Location: Between the pavement and promenade behind westernmost bench immediately northwest of 'the crocodile' tourist attraction.		
Perceptual Qualities (remoteness/sounds/tranquillity): Cars, cyclists, walkers on road, maritime activity, beach walkers. Very little sense of remoteness and tranquillity.		
Landscape Condition: Coastal tourist destination well maintained beaches and facilities.		

Viewpoint 8: Kaimes Hill		
Camera format: *Digital SLR*	Camera height: approx. *1.50m*	Lens focal length: *50mm (fixed)*
Date / Time: 25/02/2022 10:35	GPS: NS 22578, 53241 GPS Accuracy: ~7m	Weather / visibility: Sun / some cloud and haze in distance Very good to Good
Description of Exact Location: On distinctive ridge / false summit on path to the west of the summit (no view from trig point at summit).		
Perceptual Qualities (remoteness/sounds/tranquillity): Quite remote and tranquil – some maritime activity visible and settlement.		
Landscape Condition: Upland grasses and heather in good condition.		

Viewpoint 9: West Kilbride (Portencross Road)		
Camera format: *Digital SLR*	Camera height: approx. *1.50m*	Lens focal length: *50mm (fixed)*
Date / Time: 04/03/2022 11:20	GPS: NS 20158, 48470 GPS Accuracy: ~7m	Weather / visibility: Sun / some cloud Very good
Description of Exact Location: Portencross Road next to driveway to no 23 (on manhole cover).		
Perceptual Qualities (remoteness/sounds/tranquillity): Cars, cyclists, buses on road, walkers on adjacent pavement. Very little sense of remoteness and tranquillity.		
Landscape Condition: Hedgerow and field well maintained.		

Viewpoint 10: Fairlie (Allenton Park Terrace)		
Camera format: *Digital SLR*	Camera height: approx. *1.50m*	Lens focal length: *50mm (fixed)*
Date / Time: 25/02/2022 9:15	GPS: NS 20835, 55780 GPS Accuracy: ~7m	Weather / visibility: Sun / some cloud and haze in distance Very good to Good
Description of Exact Location: At the northern corner of Allenton Park Terrace at 'Private Road' sign.		
Perceptual Qualities (remoteness/sounds/tranquillity): Beach walkers, cars nearby, settlement. Not remote, beach sounds (water, seagulls).		
Landscape Condition: Urban edge well maintained.		

Appendix 14C: Viewpoint Analysis

Appendix 14C
Viewpoint analysis

14.1 Introduction

14.1.1 The viewpoint analysis is used to assist the design and further define the scope of the assessment process. In particular, the outer distance from the Proposed Works, where significant effects may be likely has been identified. This has been used to focus the baseline information and detailed reporting of the Landscape and Visual Impact Assessment (LVIA) in **Chapter 14: LVIA**.

14.2 Viewpoint and cumulative viewpoint analysis

14.2.1 The viewpoint analysis has been conducted for 10 No. viewpoints, as illustrated in **Figures 14.8-17**.

14.2.2 Cumulative developments that would be visible within the 3 km study area have been included in the assessment.

Geographical Extent of Potentially Significant Visual Effects

14.2.3 The outer distance from the Proposed Works, where significant effects may be likely has been identified by the viewpoint analysis of the Proposed Works. Further, cumulative viewpoint analysis has identified a potential threshold for significant cumulative visual effects that would result from the Proposed Works, in addition to, or in combination with other existing and consented developments, and proposed developments where a planning application has been submitted.

Potential for significant effects: Proposed Works

14.2.4 Viewpoint assessment is presented in **Table 14C.1**.

14.2.5 The viewpoint analysis indicates that significant visual effects are likely to affect locations along the low-lying coastline to the west and north / north-east within approximately 0.6 km distance from the Proposed Works. This would mostly affect recreational walkers accessing the Ayrshire Coastal Path, where there would be clear views of the Proposed Works in Viewpoints 1 and 2 (**Figure 14.8 and 14.9**). Significant effects on views are also identified to the south, within 0.7 km of the Proposed Works at Viewpoint 3. This would affect recreational walkers accessing Goldenberry Hill.

14.2.6 Views from the wider area (for example Viewpoints 4, 5 and 9) are screened by intervening landform or vegetation such that there are only partial views of the Safestore. Views from other locations often feature HNA as a focal feature but in contrast, the dark hues of HNB often reduce its prominence such that the demolition of low-lying buildings and the retention of the re-clad reactor building would have less of a visual impact. This is the case with Viewpoints 6, 7 and 10.

Potential for significant cumulative effects

14.2.7 Significant visual cumulative effects as a result of the introduction of the Proposed Works would occur at Viewpoints 1 and 2 where the Proposed Works would be seen in close proximity during the Preparations for Quiescence phase.

14.2.8 Significant cumulative effects as a result of other developments would occur from the existing HNA Safestore buildings which are noticeable features in views due to their white cladding which contrasts with surrounding landscape features and draws the eye. Significant cumulative effects would also arise from the introduction of the consented high voltage sub-sea cable manufacturing facility occupying the former Ore / Coal Terminal. This would introduce large, linear low-lying buildings along the coastline to the immediate north of the Proposed Works and would include a tall (185 m) tower.

14.2.9 Cumulative effects arising from the Final Site Clearance phase of the HNA Safestore buildings are assessed as beneficial in views with temporary Significant effects occurring due to the demolition activity at close range in Viewpoints 1, 2 as well as from Millport (Viewpoint 7) where the HNA buildings form a noticeable focal point in key views.

14.2.10 As noted in the methodology in **Appendix 14A** and in paragraph 14.8.1, cumulative effects during the Final Site Clearance phase have not been assessed since this phase would occur in approximately 90 – 100 years time. It is not possible to predict potential cumulative development or changes to existing / proposed developments across this time period.

Interpretation of Viewpoint Analysis Summary Tables

14.2.11 The information set out in **Table 14C.2** provides a summary of the viewpoint analysis of the effects of the Proposed Works on a 'solus' or primary basis, and on a cumulative basis.

14.2.12 This 'solus' part of the assessment helps to define the contribution the Proposed Works would make to any subsequent cumulative assessments (in addition to, or in combination with, other development). It is divided into the three phases of the Proposed Works (Preparations for Quiescence phase, Quiescence phase, and Final Site Clearance phase).

14.2.13 The cumulative analysis sets out the effects of Proposed Works assessing two scenarios in accordance with the methodology in **Appendix 14A**.

14.3 Sunlight and Weather Conditions

14.3.1 Changing weather patterns and local climatic conditions would influence the visibility of the Proposed Works which would vary from periods of low visibility (fog, low cloud, and bright sunny conditions that are accompanied by haze generated by temperature inversions) as well as periods of high visibility in clear weather. In some instances, the Proposed Works may appear 'back-lit' (e.g. appearing darker in colour during sunset/sunrise and periods of pale or white blanket cloud) and in other circumstances may appear to be 'up-lit' (e.g. during stormy periods that combine dark clouds and bright sunshine). All of the viewpoint analysis and assessment has assumed conditions of good weather and clear visibility.

Table 14C.1 Viewpoint Analysis

	Viewpoint 1: Ayrshire Coastal Path (approach from the east) (see Figure 14.8)
Description	This viewpoint is located on the Ayrshire Coastal Path which is aligned along the highway footpath of Power Station Road close to Hunterston Sands. It is sited at a distance of approximately 0.35 km to the north / north-east of the HNB Nuclear Site Licence Boundary ("the Site") at an elevation of 4 m AOD. The baseline view is illustrated in **Figure 14.8** and shows an open view available to westbound walkers across a foreground comprising highway, highway verge and pastoral grassland separated by a low fence. The reactor building and adjoining turbine hall within Hunterston B are clearly visible as a prominent visual feature extending above Goldenberry Hill to the south of the Site. A number of other lower height ancillary buildings which extend to the north-east and north-west of the reactor buildings of Hunterston B are also evident in the view, either viewed against a backdrop of other larger scale buildings (including the white clad Safestores housing the two reactor buildings of Hunterston A), against the landform of Goldenberry Hill or the more distant hills of the Isle of Arran. An intervening overgrown hedgerow would provide some partial screening of the ancillary buildings to the north-west of the reactor building from this viewpoint in summer months.
Sensitivity	The viewpoint is not located within any nationally or locally designated landscapes but is located on the Ayrshire Coastal Path long distance walking route. The value of the viewpoint is therefore assessed as High-Medium. The view would be experienced by recreational walkers whose attention is likely to be on the surrounding landscape features. Therefore, susceptibility to change, and consequently the sensitivity is assessed as *High*.
Magnitude of Change	Preparations for Quiescence phase: During this phase, many of the low-lying buildings to the left and right of the view would be demolished. However, some of the buildings to the fore of the reactor building would be retained for processing works during the Preparations for the Quiescence phase and removed at the end of the phase. The reactor building would be retained and repurposed as the Safestore, which would retain the same footprint and height as the existing building. This building would be clad in panels approximately matching the existing colour of the building (dark grey-green). The magnitude of change would be High-Medium as a result of the dismantling and deconstruction activity which would include movement of cranes and machinery reducing to Very Low towards the end of the Preparations for Quiescence phase due to the reduced massing and spread of buildings in the view. *Cumulative Magnitude of Change:* The existing HNA Safestore buildings are located immediately adjacent to the Proposed Works and form two visible, tall elements on the skyline of the view. Their white cladding contrasts highly with surrounding features and draws the eye. The magnitude of change from the HNA Safestores and associated buildings is High-Medium. Quiescence phase: The Safestore would remain in situ during this phase and there would be reduced activity. The magnitude of change would remain Very Low. *Cumulative Magnitude of Change:* The HNA Safestore buildings would be demolished approximately 15 years before the end of the Quiescence phase. This would reduce the massing of built form adjacent to the Site and remove white-clad buildings from the centre-right of the view. The

	Viewpoint 1: Ayrshire Coastal Path (approach from the east) (see Figure 14.8)			
	magnitude of change would be High-Medium as a result of the demolition activity reducing to Very Low due to the reduced massing and presence of buildings in the view. Final Site Clearance phase: There would be increased activity on the Site compared to the Quiescence phase as the Safestore is emptied and demolished. The process would include the creation of temporary waste management buildings and the introduction of machinery and movement. The magnitude of change would be High-Medium as a result of the demolition activity which would include movement of cranes and machinery reducing to Very Low to Zero towards the end of the Final Site Clearance phase due to the reduced massing and spread of buildings in the view and the re-integration of the Indicative Dismantling Works Area (Works Area) into the landscape.			
Assessment of Effects	Phase of Works	Preparations for Quiescence	Quiescence	Final Site Clearance
	Sensitivity	High		
	Magnitude	High-Medium reducing to Very Low	Very Low	High-Medium reducing to Very Low to Zero
	Level of Effect	**Major to Major / Moderate** and Significant reducing to Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	**Major to Major / Moderate** and Significant reducing to Moderate / Minor to None and Not Significant
	Type of effect	Medium to Long term, direct neutral (retention of building) and beneficial (removal of lower lying buildings)..	Long term direct and neutral.	Medium to Long term, direct and neutral to beneficial.
	Cumulative Level of Effect - Combined	**Major to Major / Moderate** and Significant (due to HNA) (Viewing west)	**Major to Major / Moderate** and Significant (due to HNA) reducing to Moderate and Not Significant	N/A
	Cumulative Level of Effect - Additional	High-Medium reducing to Very Low	Moderate / Minor and Not Significant	N/A

Figure 14.9	**Viewpoint 2: Ayrshire Coastal Path (approach from the west)**
Description	Viewpoint 2 is located on the Ayrshire Coastal Path which continues to follow the highway footpath of Power Station Road close to Hunterston Sands. It forms part of the Works Area and is sited at the Site boundary at an elevation of 4 m AOD. **Figure 14.9** illustrates the baseline view from this viewpoint comprising an open foreground comprising highway, highway verge and maintained amenity grassland

Figure 14.9	Viewpoint 2: Ayrshire Coastal Path (approach from the west)
	which separates the road from the car park for the power station. The reactor building is clearly visible as a prominent visual feature extending above the Crosbie Hills whilst the adjoining turbine hall and other lower height ancillary buildings which extend to the north of the reactor building, are viewed against a landscape backdrop of the distant hills. The high-voltage, direct current (HVDC) station to the south of the reactor building is also visible against the lower slopes of Goldenberry Hill. The parked cars, lighting columns and low-level buildings all contribute to the visual clutter within this view.
Sensitivity	The viewpoint is not located within any nationally or locally designated landscapes but is located on the Ayrshire Coastal Path long distance walking route. The value of the viewpoint is therefore assessed as High-Medium. The view would be experienced by recreational walkers whose attention is likely to be on the surrounding landscape features. Therefore, susceptibility to change, and consequently the sensitivity is assessed as *High*.
Magnitude of Change	Preparations for Quiescence phase: During this phase of the works, many of the low-lying buildings in the view would be dismantled and removed. However, some of the lower height buildings to the north-east of the reactor building would be retained for processing works during the Preparations for Quiescence phase and removed at the end of the phase. The reactor building would be retained and repurposed as the Safestore, which would retain the same footprint and height as the existing building. The Safestore would be clad in panels approximately matching the existing colour of the building (dark grey-green) and would be the only building remaining at the end of the Preparations for Quiescence phase. The magnitude of change would be High-Medium as a result of the dismantling and deconstruction activity which would include movement of cranes and machinery reducing to Very Low towards the end of the Preparations for Quiescence due to the reduced massing and spread of buildings in the view. *Cumulative Magnitude of Change:* The existing HNA Safestore buildings are located immediately adjacent to the Proposed Works and form two visible, tall elements just out of view to the right. The HNA Safestores occupy a large part of the view due to their close proximity. The magnitude of change from the HNA Safestores and associated buildings is High. The consented high voltage sub-sea cable manufacturing facility occupying the former Ore / Coal Terminal would introduce a 185 m tower just out of view to the left at approximately 2 km distance. The tower would be visible on the skyline and would act as a focal point in views north. The magnitude of change would be High to Medium. Quiescence phase: The Safestore would remain in situ during this phase and there would be reduced activity. Mitigation planting (identified in **Appendix 14G**) would increasingly screen / filter views of the Works Area as it matures during this phase. The magnitude of change would remain Very Low. *Cumulative Magnitude of Change:* The HNA Safestore buildings would be demolished approximately 15 years before the end of the Quiescence phase. This would reduce the massing of built form adjacent to the Site and remove white-clad buildings from the right of the view. The magnitude of change would be High-Medium as a result of the demolition activity reducing to Very Low to Zero due to the reduced massing and presence of buildings in the view. The level of effect from the cable manufacturing facility would remain High to Medium. Final Site Clearance phase:

Figure 14.9	**Viewpoint 2: Ayrshire Coastal Path (approach from the west)**			
	There would be increased activity on the Site as the Safestore is emptied and demolished. The process would include the creation of temporary waste management buildings and the introduction of machinery and movement. Views of lower lying dismantling activities would be partially screened by mature mitigation planting (see **Appendix 14G**). The magnitude of change would be High-Medium as a result of the demolition activity which would include movement of cranes and machinery reducing to Very Low to Zero towards the end of the Final Site Clearance phase due to the reduced massing and spread of buildings in the view.			
Assessment of Effects	Phase of Works	Preparations for Quiescence	Quiescence	Final Site Clearance
	Sensitivity	High		
	Magnitude	High-Medium reducing to Very Low	Very Low	High-Medium reducing to Very Low to Zero
	Level of Effect	**Major to Major / Moderate** and Significant reducing to Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	**Major to Major / Moderate** and Significant reducing to Moderate / Minor to None and Not Significant
	Type of effect	Medium to Long term, direct and neutral (retention of building) and beneficial (removal of lower lying buildings).	Long term, direct and neutral.	Medium to Long term, direct and neutral to beneficial.
	Cumulative Level of Effect - Combined	**Major to Major / Moderate** and Significant (due to HNA, cable manufacturing facility and Proposed Works)	**Major to Major / Moderate** and Significant (due to HNA and the cable factory) reducing to Moderate / Minor and Not Significant	N/A
	Cumulative Level of Effect - Additional	**Major to Major / Moderate** and Significant reducing to Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	N/A

Figure 14.10	**Viewpoint 3: Goldenberry Hill**
Description	This viewpoint is located on Goldenberry Hill, to the south of the Site. It is sited 0.7 km south of the Site and 1.1 km to the south-south-west of the reactor building at an elevation of 140 m AOD.

Figure 14.10	Viewpoint 3: Goldenberry Hill
	The elevated baseline view from Viewpoint 3 is illustrated in **Figure 14.10**. This shows a panoramic view across the redundant Hunterston Port and Resource Centre which extend into the waters of the Fairlie Roads and beyond to Great Cumbrae and along the coastline towards Largs. The top of the reactor building (south-eastern and south-western elevation) is visible as a moderately prominent built component of the view, sharing its prominence with the surrounding landform, whilst the roof of the adjoining turbine hall is also evident in the view. Very few ancillary buildings within the Works Area are visible from this viewpoint.
Sensitivity	The viewpoint is not located within any nationally or locally designated landscapes and is not part of a promoted walking route. The value of the viewpoint is therefore assessed as Medium. The view would be experienced by recreational walkers whose attention is likely to be on the surrounding landscape features. Therefore, susceptibility to change, and consequently the sensitivity is assessed as *High*.
Magnitude of Change	Preparations for Quiescence phase: During this phase of the works, most of the partially visible low-lying buildings surrounding the reactor building in the view would be demolished. However, some of the lower height buildings to the immediate north-east of the reactor building would be retained for processing works during the Preparations for Quiescence phase and removed at the end of the phase. The reactor building would be retained and reused as the Safestore which would retain the same footprint and height as the existing building. This building would be clad in panels approximately matching the existing colour of the building (dark grey-green) and would be the only building remaining at the end of the Preparations for Quiescence phase. The magnitude of change would be Low as a result of the cladding of the Safestore and dismantling and deconstruction activity and which would be partially screened from view by intervening landform and vegetation to Very Low towards the end of the phase due to the reduced spread of buildings in the view. The effect would be Not Significant due to the reuse of the existing footprint and massing of the reactor building in the view. *Cumulative Magnitude of Change:* The tip of one of the HNA Safestore towers is visible beyond the undulating landform in the view. The magnitude of change is Very Low. The high voltage sub-sea cable manufacturing facility occupying the former Ore / Coal Terminal would introduce a 185m tower and large scale lower lying buildings on the reclaimed industrial Hunterston Port and Resource Centre at approximately 2km distance. The tower would be seen against the rising hills and would form a focal point in views north along the coastline. The magnitude of change would be Medium Quiescence phase: The Safestore would remain in situ during this phase and there would be reduced activity. Mitigation planting (see **Appendix 14G**) would increasingly screen / filter views of the Works Area as it matures during this phase. The magnitude of change would remain Very Low. *Cumulative Magnitude of Change:* The HNA Safestore buildings, just visible towards the left of the view will be demolished approximately 15 years before the end of the Quiescence phase. This would slightly reduce the massing of built form adjacent to the site and remove white-clad building and roofline from the view. The magnitude of change would be Low as a result of the demolition activity reducing to Very Low to Zero due to the reduced massing and presence of buildings in the view. The level of effect from the cable manufacturing facility would remain Medium whilst it is in situ.

Figure 14.10	Viewpoint 3: Goldenberry Hill			
	Final Site Clearance phase: There would be increased activity on the Site as the Safestore is emptied and demolished. The process would include the creation of temporary waste management buildings and the introduction of machinery and movement. Views of lower lying dismantling activities would be partially screened by mature mitigation planting. The magnitude of change would be High-Medium as a result of the demolition activity which would include movement of cranes and machinery reducing to Very Low to Zero towards the end of the phase due to the removal of a foreground building in the view.			
Assessment of Effects	Phase of Works	Preparations for Quiescence	Quiescence	Final Site Clearance
	Sensitivity	High		
	Magnitude	Low reducing to Very Low	Very Low	High-Medium reducing to Very Low to Zero
	Level of Effect	Moderate reducing to Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	**Major to Major / Moderate** and Significant reducing to Moderate / Minor to None and Not Significant
	Type of effect	Medium to Long term, direct and neutral (recladding) to beneficial (removal of buildings).	Long term, direct and neutral.	Medium to Long term, direct and neutral (during works due to limited visibility) to beneficial (removal of buildings).
	Cumulative Level of Effect - Combined	Moderate and Not Significant	Moderate and Not Significant	N/A
	Cumulative Level of Effect - Additional	Moderate reducing to Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	N/A

Figure 14.11	Viewpoint 4: Core Path NC36 near Hunterston Castle
Description	Viewpoint 4 is located on Core Path NC36 which follows Old Road to the east of Hunterston Castle. It is sited approximately 0.5 km to the east of the Site and 0.7 km to the east of the reactor building, at an elevation of approximately 10 m AOD. **Figure 14.11** illustrates the baseline view from this viewpoint and shows a view across the grounds to the north of Hunterston Castle towards the walled garden located to the west of the Castle. The corner and top of the south-eastern façade of the reactor

Figure 14.11	Viewpoint 4: Core Path NC36 near Hunterston Castle			
	building is partially visible in heavily filtered views through the top of intervening deciduous tree cover in winter conditions and has a very minor visual role. There are no views of any other buildings within the Site. During the summer months when trees are in full leaf, it is expected that there would be no views of the reactor building.			
Sensitivity	The viewpoint is not located within any nationally or locally designated landscapes however it is located on a promoted Core Path. In addition, Hunterston Castle is a tourist destination. The value of the viewpoint is therefore assessed as High. The view would be experienced by recreational walkers and visitors to the castle whose attention is likely to be on the surrounding landscape features. Therefore, susceptibility to change, and consequently the sensitivity is assessed as *High*.			
Magnitude of Change	Preparations for Quiescence phase: There would be little visibility of the Proposed Works from this location due to screening from intervening vegetation. The reactor building would be retained and repurposed as the Safestore which would retain the same footprint and height as the existing building. Work on the facing façade of the building including re-cladding may be visible in winter views. The cladding would be coloured such that it would integrate the building into the surrounding vegetation. This building would be the only building remaining at the end of the Preparations for Quiescence phase. The magnitude of change would be Very Low as a result of the demolition and deconstruction activity which would be mostly screened from view. *Cumulative Magnitude of Change:* There would be no cumulative change in the view. Quiescence phase: The Safestore would remain in situ during this phase and there would be reduced activity. The magnitude of change would remain Very Low. *Cumulative Magnitude of Change:* There would be no cumulative change in the view. Final Site Clearance phase: There would be increased activity on the Site as the Safestore is emptied and demolished. The process would introduce machinery and movement but would be mostly screened particularly in summer months. The magnitude of change would be Low as a result of the demolition activity which would include movement of cranes and machinery reducing to Zero towards the end of the phase following the removal of the Safestore in the view.			
Assessment of Effects	Phase of Works	Preparations for Quiescence	Quiescence	Final Site Clearance
	Sensitivity	High		
	Magnitude	Very Low	Very Low	Low reducing to Zero
	Level of Effect	Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	Moderate reducing to None and Not Significant
	Type of effect	Medium to Long term, direct and neutral.	Long term direct and neutral.	Medium to Long term, direct and neutral during demolition works to beneficial

				following Stie clearance.
	Cumulative Level of Effect - Combined	No effect	No effect	N/A
	Cumulative Level of Effect - Additional	No effect	No effect	N/A

Figure 14.11	**Viewpoint 4: Core Path NC36 near Hunterston Castle**

Figure 14.12	**Viewpoint 5: A78 near junction with Kilrusken Toll**
Description	Viewpoint 5 is located on the A78 near to the junction with Kilrusken Toll. It is sited approximately 1.7 km to the east / south-east of the reactor building within, at an elevation of approximately 20 m AOD. The baseline view from this route is illustrated in **Figure 14.12**. This shows an open view across agricultural fields with the upper façade of the reactor building, visible in the middle distance above the pockets of woodland which are present to the east of the Site and which coalesce to provide a belt of continuous tree cover. The turbine hall and the lower height ancillary buildings present within the Site are not evident in baseline views. The top of the Safestore of HNA is also visible above the tree line with the white clad facade contrasting with surrounding colours in the landscape.
Sensitivity	The viewpoint is not located within any nationally or locally designated landscapes. The value of the viewpoint is therefore assessed as Medium. The view would be experienced by road users whose attention is likely to be on the road ahead. Therefore, susceptibility to change, and consequently the sensitivity is assessed as *Medium*.
Magnitude of Change	Preparations for Quiescence phase: There would be little visibility of the Proposed Works from this location due to screening from the intervening tree belt and Campbelton Hill landform. The reactor building would be retained and repurposed as the Safestore which would retain the same footprint and height as the existing building. Work on the facing façade of the building including re-cladding would be visible. The cladding would be coloured such that it would integrate the building into the surrounding landscape features. The Safestore would remain in the view at the end of the phase. The magnitude of change would be Very Low as a result of the recladding and demolition activity which would be mostly screened from view. *Cumulative Magnitude of Change:* The tip of one of the HNA Safestore buildings is visible above the treeline to the left of the HNB reactor building. The magnitude of change is Very Low. The high voltage sub-sea cable manufacturing facility occupying the former Ore / Coal Terminal would introduce a 185 m tower just beyond the extent of the view to the right at approximately 2 km distance. The tower would be seen on the skyline and would form a focal point in the direction of travel for northbound road users. The magnitude of change would be Medium. Quiescence phase: The Safestore would remain in situ during this phase and there would be reduced activity. There would be little change to the massing of buildings in the baseline view. The magnitude of change would remain Very Low.

Figure 14.12	Viewpoint 5: A78 near junction with Kilrusken Toll			
	Cumulative Magnitude of Change: The HNA Safestore building, just visible towards the left of the view will be demolished approximately 15 years before the end of the Quiescence phase. This would slightly reduce the massing of built form adjacent to the Site and remove the white-clad building from the view. The magnitude of change would be Very Low as a result of the demolition activity reducing to Zero. The level of effect from the cable manufacturing facility would remain Medium whilst it is in situ. Final Site Clearance phase: There would be increased activity on the Site as the Safestore is emptied and demolished. The process would introduce machinery and movement to the view. The magnitude of change would be Low as a result of the demolition activity which would include movement of the upper parts of cranes and machinery reducing to Zero towards the end of the phase due to the removal of the Safestore in the view leaving the existing tree line.			
Assessment of Effects	Phase of Works	Preparations for Quiescence	Quiescence	Final Site Clearance
	Sensitivity	Medium		
	Magnitude	Very Low	Very Low	Low reducing to Zero
	Level of Effect	Minor and Not Significant	Minor and Not Significant	Moderate / Minor reducing to None and Not Significant
	Type of effect	Medium to Long term, direct and neutral.	Long term direct and neutral.	Medium to Long term, direct and adverse (during dismantling activity) to beneficial (following Site claeance).
	Cumulative Level of Effect - Combined	Moderate and Not Significant	Moderate and Not Significant	N/A
	Cumulative Level of Effect - Additional	Minor and Not Significant	Minor and Not Significant	N/A

Figure 14.13	Viewpoint 6: 'The Lion', Great Cumbrae
Description	Viewpoint 6 is located at Lion Rock and close to Core Path NC1, which follows the B896 along the western coastline of Great Cumbrae. The location is a recognised viewpoint on 1:25,000 scale OS mapping with car parking, seating and interpretation board available. It is sited approximately 3.3 km to the north of the Site, at an elevation of approximately 5 m AOD. **Figure 14.13** illustrates the baseline view from Viewpoint 6 and shows an open coastal view across the Fairlie Roads towards the mainland. The reactor building forms a clearly identifiable feature in baseline views, partially extending above a landscape

Figure 14.13	Viewpoint 6: 'The Lion', Great Cumbrae
	backdrop which comprises the lower slopes of Goldenberry Hill. The HNA Safestore is visible to the west of the Site, with their visual presence emphasised by the white cladding of the structures which contrasts with the darker landscape backdrop of Goldenberry Hill. The turbine hall and lower height ancillary buildings within the Site as well as the HVDC station to the south of the reactor building are visible as small to very small-scale components of the view and their darker tone helps them to visually recede against the darker colour of the plantation woodlands on the north facing lower slopes of Goldenberry Hill.
Sensitivity	The viewpoint is located within the locally designated Great Cumbrae SLA and is noted as a viewing location on OS maps. The value of the viewpoint is therefore assessed as High. The view would be experienced by visitors to the island who are provided with interpretation boards and seating to enjoy the view. Therefore, susceptibility to change, and consequently the sensitivity is assessed as *High*.
Magnitude of Change	Preparations for Quiescence phase: Visibility of the Proposed Works from this location would be distant and appear relatively small scale in the wider coastline view. The buildings being removed are integrated into the view due to their darker colour and consequently their removal would not be as noticeable. The reactor building would be retained and repurposed as the Safestore which would retain the same footprint and height as the existing building. Work on the facing façade of the building including re-cladding would be visible in clear conditions in a small part of the view. The cladding would be coloured such that it would re-integrate the building into the surrounding vegetation. The pylon and associated high voltage cables to the left of the reactor building would be dismantled and removed during this period. This building would be the only building remaining at the end of the phase. The magnitude of change would be Very Low as a result of the Proposed Works. *Cumulative Magnitude of Change:* The existing HNA Safestore buildings are located immediately adjacent to the HNB reactor building and form two visible, tall elements in the landscape due to their white cladding which contrasts highly with surrounding features and draws the eye. Although tall, they do not break the skyline of the view and are not the main focus of views from this location. The magnitude of change from the HNA Safestores and associated buildings is Low. The high voltage sub-sea cable manufacturing facility occupying the former Ore / Coal Terminal would introduce large scale linear buildings and a 185 m tower along the coastline to the left of the Proposed Works at approximately 2 km distance. The tower would be seen on the skyline and would form a new focal point in the view. The magnitude of change would be Medium. Quiescence phase: The Safestore would remain in situ during this phase and there would be reduced activity. There would be little change to the massing of buildings in the baseline view. The magnitude of change would remain Very Low. *Cumulative Magnitude of Change:* The white clad HNA Safestore buildings, forming a minor focal point to the right of the HNB Safestore building would be demolished approximately 15 years before the end of the Quiescence phase. This would reduce the massing of built form adjacent to the Site and remove the noticeable white-clad buildings from the view. The magnitude of change would be Low as a result of the demolition activity reducing to Zero. The magnitude of change from the cable manufacturing facility would remain Medium whilst it is in situ.

Figure 14.13	Viewpoint 6: 'The Lion', Great Cumbrae			
	Final Site Clearance phase: There would be increased activity on the Site as the Safestore is emptied and demolished. The process would introduce machinery and movement to the view. The magnitude of change would be Low as a result of the demolition activity which would include movement of cranes and machinery reducing to Zero towards the end of the phase due to the removal of the Safestore in the view.			
Assessment of Effects	Phase of Works	Preparations for Quiescence	Quiescence	Final Site Clearance
	Sensitivity	High		
	Magnitude	Very Low	Very Low	Low reducing to Zero
	Level of Effect	Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	Moderate reducing to None and Not Significant
	Type of effect	Medium to Long term, direct and neutral.	Long term, direct and neutral.	Medium to Long term, direct and adverse to beneficial.
	Cumulative Level of Effect - Combined	**Moderate** and Significant (due to cable manufacturing facility)	**Moderate** and Significant (due to cable manufacturing facility)	N/A
	Cumulative Level of Effect - Additional	Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	N/A

Figure 14.14	Viewpoint 7: Millport, Great Cumbrae
Description	This viewpoint is located just to the south of the B896 Glasgow Street in Millport and close to the coastal promenade, where lines of benches are oriented south to provide views across the Fairlie Roads. It is sited approximately 4 km to the north-north-west of the reactor building, at an elevation of approximately 5 m AOD. The baseline view is illustrated in **Figure 14.14**. The foreground of the view comprises a sandy foreshore beyond which the waters of Millport Bay and Fairlie Roads extend towards the mainland. The reactor building is visible as an identifiable middle-ground component extending above the lower slopes of Goldenberry Hill and the neighbouring Campbelton Hill. The lower height turbine hall and ancillary buildings within the Site as well as HVDC station to the south of the reactor building are visible as small to very small-scale built components against a backdrop of the two referenced landforms and their smaller scale and darker colour enables these buildings to recede against a landscape background. The HNA Safestore is visible to the west of the Site, visible against a backdrop of Goldenberry Hill although their white clad facades emphasise their visual presence.
Sensitivity	The viewpoint is located within the locally designated Great Cumbrae SLA and is a popular tourist destination. The value of the viewpoint is therefore assessed as High. The view would be experienced by visitors to the island and residents who access the

Figure 14.14	Viewpoint 7: Millport, Great Cumbrae			
	beach, promenade and seating oriented to experience the view. Therefore, susceptibility to change, and consequently the sensitivity is assessed as *High*.			
Magnitude of Change	Preparations for Quiescence phase: Visibility of the Proposed Works from this location would be distant across the Fairlie Roads and appear relatively small scale in the wider coastline view. The buildings being removed are integrated into the view due to their darker colour Low-lying position to the fore of Goldenberry Hill. Consequently, their removal would not be as noticeable. The reactor building would be retained and repurposed as the Safestore which would retain the same footprint and height as the existing building. Work on the facing façade of the building including re-cladding would be visible. The cladding would be coloured such that it would re-integrate the building into the surrounding vegetation. The reclad Safestore would be the only building remaining at the end of the phase. The magnitude of change would be Very Low as a result of the demolition and deconstruction activity. *Cumulative Magnitude of Change:* The existing HNA Safestore buildings are located immediately adjacent to the HNB reactor building and form two visible, tall elements in the view due to their white cladding which contrasts highly with surrounding features and draws the eye. They are located in the main orientation of the view from the beach. Although tall, they do not break the skyline of the view. The magnitude of change from the HNA Safestores and associated buildings is Low. The high voltage sub-sea cable manufacturing facility occupying the former Ore / Coal Terminal would introduce a 185 m tower along the coastline to the left of the Proposed Works at approximately 2 km distance. The lower parts of the development would be screened by the headland at Farland Point. The tower would be seen on the skyline and would form a new focal point in the view. The magnitude of change would be Medium. Quiescence phase: The Safestore would remain in situ during this phase and there would be reduced activity. There would be little change to the massing of buildings in the baseline view. The magnitude of change would remain Very Low. *Cumulative Magnitude of Change:* The white clad HNA Safestore buildings, forming a focal point to the right of the HNB Safestore building would be demolished approximately 15 years before the end of the Quiescence phase. This would reduce the massing of built form adjacent to the site and remove the noticeable white-clad buildings from the view. The magnitude of change would be Low as a result of the demolition activity reducing to Zero. The level of effect from the cable manufacturing facility would remain Medium whilst it is in situ. Final Site Clearance phase: There would be increased activity on the Site as the Safestore is emptied and demolished. The process would introduce machinery and movement to the view. The magnitude of change would be Low as a result of the demolition activity which would include movement of cranes and machinery reducing to Zero towards the end of the Final Site Clearance phase due to the removal of the Safestore in the view.			
Assessment of Effects	Phase of Works	Preparations for Quiescence	Quiescence	Final Site Clearance
	Sensitivity	High		

Figure 14.14	Viewpoint 7: Millport, Great Cumbrae			
	Magnitude	Very Low	Very Low	Low reducing to Zero
	Level of Effect	Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	Moderate reducing to None and Not Significant
	Type of effect	Medium to Long term, direct and neutral.	Long term, direct and neutral.	Medium to Long term, direct and adverse due to deconstruction activity to beneficial following Site clearance.
	Cumulative Level of Effect - Combined	**Moderate** (due to HNA and the Cable manufacturing facility) and Significant	**Moderate** (HNA demolition works and the Cable manufacturing facility)	N/A
	Cumulative Level of Effect - Additional	Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	N/A

Figure 14.15	Viewpoint 8: Kaim Hill
Description	Viewpoint 8 is located of Kaim Hill within Clyde Muirshiel Regional Park and the Mainland SLA. It is sited approximately 4.3 km to the north-east of the reactor building, at an elevation of approximately 380 m AOD. **Figure 14.15** illustrates the expansive, panoramic views which are available from this elevated location. The foreground of the view comprises rough grassland (snow covered at the time of the survey), with Little and Great Cumbrae and the distant hill of the Isle of Arran all identifiable landforms in the view, separated by the Fairlie Roads and the Firth of Clyde. The reactor building is visible as a mid-ground component, viewed against a backdrop of the low-lying coastal strip. The white clad HNA Safestore draw the viewer's eye. The elevated nature of the viewpoint has the consequence that many of the lower height ancillary buildings within the Site as well as the HVDC station to the south of the reactor building are also discernible as small to very small-scale visual components against a landscape backdrop.
Sensitivity	The viewpoint is located within the locally designated Mainland SLA and the Clyde Muirshiel Regional Park. The value of the viewpoint is therefore assessed as High. The view would be experienced by recreational walkers whose attention would be focused on the surrounding landscape features. Therefore, susceptibility to change, and consequently the sensitivity is assessed as *High*.
Magnitude of Change	Preparations for Quiescence phase: Visibility of the Proposed Works from this location would be distant and appear relatively small scale in the wider panoramic view. The Proposed Works would be difficult to discern due but the gradual clearance of low-lying buildings would be noticeable. The reactor building would be retained and repurposed as the Safestore which would retain the same footprint and height as the existing building. Work on the facing façades of the building including re-cladding would be visible. The cladding

Figure 14.15	Viewpoint 8: Kaim Hill			
	would be coloured such that it would re-integrate the building into the surrounding vegetation, although it would be visible against the white HNA Safestore. The reclad Safestore would be the only building remaining at the end of the phase. The magnitude of change would be Very Low as a result of the demolition and deconstruction activity. *Cumulative Magnitude of Change:* The existing HNA Safestore buildings are located immediately adjacent to and partially behind the HNB reactor building and form noticeable but small elements in the wide view due to their white cladding which contrasts highly with surrounding features and draws the eye. The magnitude of change from the HNA Safestores and associated buildings is Very Low. The tip of the tower from the high voltage sub-sea cable manufacturing facility occupying the former Ore / Coal Terminal would be visible. The lower parts of the development would be screened by landform. The tower would be seen against the sea and would form a minor focal point in the view. The magnitude of change would be Low. Quiescence phase: The Safestore would remain in situ during this phase and there would be reduced activity. There would be little change to the massing of buildings in the baseline view. The magnitude of change would remain Very Low. The level of effect from the cable manufacturing facility would remain Low whilst it is in situ. *Cumulative Magnitude of Change:* The white clad HNA Safestore buildings, forming a minor focal point in the view would be demolished approximately 15 years before the end of the Quiescence period. This would reduce the massing of built form adjacent to the Site and remove the noticeable white clad buildings from the view. The magnitude of change would be Very Low as a result of the demolition activity reducing to Zero. Final Site Clearance phase: There would be increased activity on the Site as the Safestore is emptied and demolished. The process would introduce machinery and movement to the view. The magnitude of change would be Very Low as a result of the demolition activity which would include movement of cranes and machinery in a minor part of the view reducing to Zero towards the end of the phase due to the removal of the Safestore in the view.			
Assessment of Effects	Phase of Works	Preparations for Quiescence	Quiescence	Final Site Clearance
	Sensitivity	High		
	Magnitude	Very Low	Very Low	Very Low reducing to Zero
	Level of Effect	Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	Moderate / Minor reducing to None and Not Significant
	Type of effect	Medium to Long term, direct and neutral.	Long term, direct and neutral.	Medium to Long term, direct and

Figure 14.15	Viewpoint 8: Kaim Hill			
				adverse to beneficial.
	Cumulative Level of Effect - Combined	Moderate and Not Significant	Moderate / Minor and Not Significant	N/A
	Cumulative Level of Effect - Additional	Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	N/A

Figure 14.16	Viewpoint 9: West Kilbride (Portencross Road)
Description	This viewpoint is sited on the B7048 Portencross Road on the northern edge of West Kilbride which is identified in the North Ayrshire Core Paths Plan as Core Path NC122 and the West Kilbride Cycle Route. It is located approximately 3.2 km to the south-south-east of the Site, at an elevation of approximately 55 m AOD. The baseline view is illustrated in **Figure 14.16** and shows a foreground which comprises highway and roadside hedgerow, beyond which lie agricultural fields. The reactor building is framed by the landforms of Goldenberry Hill and Campbelton Hill and viewed against a landscape backdrop of distant hills. There are no views of HNA or the lower height ancillary buildings within the Site.
Sensitivity	The viewpoint is not located within any nationally or locally designated landscapes. Although it is located on a Core Path it is situated on an urban edge. The value of the viewpoint is therefore assessed as Medium. The view would be experienced by residents in surrounding properties and recreational walkers whose attention would be focused on the surrounding landscape features. Therefore, susceptibility to change, and consequently the sensitivity is assessed as *High*.
Magnitude of Change	Preparations for Quiescence phase: There would be little visibility of the Proposed Works relating to lower lying buildings to the west and north of the reactor building or along the coastline due to screening from the intervening tree belt and Campbelton Hill landform. The reactor building would be retained and repurposed as the Safestore which would retain the same footprint and height as the existing building. Work on the facing façade of the building including re-cladding would be visible. The cladding would be coloured such that it would integrate the building into the surrounding vegetation. The pylons and associated high voltage cables to the fore of the reactor building would be dismantled and removed during this period. The Safestore would remain at the end of the phase. The magnitude of change would be Very Low as a result of activity on the Safestore. *Cumulative Magnitude of Change:* The tower of the high voltage sub-sea cable manufacturing facility occupying the former Ore / Coal Terminal would be partially visible in the middle distance to the right of the view at approximately 4 km distance. The tower would be seen against the sea and distant backdrop of Bute and would form a noticeable element in this part of the view. The magnitude of change would be Low. Quiescence phase: The Safestore would remain in situ during this phase and there would be reduced activity. The magnitude of change would remain Very Low.

Figure 14.16	Viewpoint 9: West Kilbride (Portencross Road)			
	Cumulative Magnitude of Change: The level of effect from the cable manufacturing facility would remain Low whilst it is in situ. Final Site Clearance phase: There would be increased activity on the Site as the Safestore is emptied and demolished. The process would introduce machinery and movement to the view. The magnitude of change would be Very Low as a result of the demolition activity which would include movement of the upper parts of cranes and machinery reducing to Zero towards the end of the phase due to the removal of the Safestore in the view.			
Assessment of Effects	Phase of Works	Preparations for Quiescence	Quiescence	Final Site Clearance
	Sensitivity	High		
	Magnitude	Very Low	Very Low	Very Low reducing to Zero
	Level of Effect	Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	Moderate / Minor reducing to None and Not Significant
	Type of effect	Medium to Long term, direct and neutral.	Long term, direct and neutral.	Medium to Long term, direct and adverse to beneficial.
	Cumulative Level of Effect - Combined	Moderate and Not Significant	Moderate and Not Significant	N/A
	Cumulative Level of Effect - Additional	Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	N/A

Figure 14.17	Viewpoint 10: Fairlie (Allenton Park Terrace)
Description	Viewpoint 10 is located on Allenton Park Terrace, approximately 100 m to the south of the public car parking facilities which are available on Pier Road and close to the route of the Ayrshire Coastal Path. It is sited approximately 4.5 km to the north-north-east of the Site, at an elevation of approximately 5 m AOD. **Figure 14.17** illustrates the baseline view and shows a foreground which comprises a sandy foreshore and Fairlie Road with the Hunterston Ore Terminal pier extending across the water the middle distance. The reactor building is visible against a landscape backdrop of Goldenberry Hill, with the dark façade of the building helping it to visually recede against the darker tones of the tree cover behind. The HNA Safestore is visible to the south of the Site, with their white facades and neighbouring lighter colour buildings to the south drawing the eye and emphasising their visual presence.
Sensitivity	The viewpoint is not located within any nationally or locally designated landscapes. However, it is located on the Ayrshire Coastal Path and near to a parking and picnic area. The value of the viewpoint is therefore assessed as High-Medium. The view would be experienced by residents in surrounding properties and recreational walkers

Figure 14.17	Viewpoint 10: Fairlie (Allenton Park Terrace)			
	whose attention would be focused on the surrounding landscape features. Therefore, susceptibility to change, and consequently the sensitivity is assessed as *High*.			
Magnitude of Change	Preparations for Quiescence phase: There would be filtered visibility of the Proposed Works relating to lower lying buildings due to partial screening from the intervening scrub and tree belts. Within the view, the reactor building would be retained and repurposed as the Safestore which would retain the same footprint and height as the existing building. Work on the facing façade of the building including re-cladding would be visible. The cladding would be coloured such that it would integrate the building into the surrounding vegetation. The pylons and associated high voltage cables to the left of the reactor building would be dismantled and removed during this period. The Safestore would remain at the end of the phase. The magnitude of change would be Very Low. *Cumulative Magnitude of Change:* The existing HNA Safestore buildings are located immediately adjacent to the HNB reactor building and form noticeable but small elements in the wide view due to their white cladding which contrasts with surrounding features and draws the eye. They are visible in part of the view already influenced by industrial features and do not form the main focus of the view. The magnitude of change from the HNA Safestores and associated buildings is Low. The high voltage sub-sea cable manufacturing facility would occupy the former Ore / Coal Terminal in the middle distance. The lower buildings would be partially screened by intervening vegetation and the tower would be the main part visible, forming a new focal point on the skyline of the view. The magnitude of change would be Medium. Quiescence phase: The Safestore would remain in situ during this phase and there would be reduced activity. There would be little change to the massing of buildings in the baseline view. The magnitude of change would remain Very Low. The level of effect from the cable manufacturing facility would remain Medium whilst it is in situ. *Cumulative Magnitude of Change:* The white clad HNA Safestore buildings, forming a minor focal point in the view would be demolished approximately 15 years before the end of the Quiescence phase. This would reduce the massing of built form adjacent to the Site and remove the noticeable white clad buildings from the view. The magnitude of change would be Very Low as a result of the demolition activity reducing to Zero. Final Site Clearance phase: There would be increased activity on the Site as the Safestore is emptied and demolished. The process would introduce machinery and movement to the view. The magnitude of change would be Very Low as a result of the demolition activity which would include distant movement cranes and machinery reducing to Zero towards the end of the phase due to the removal of the Safestore in the view.			
Assessment of Effects	Phase of Works	Preparations for Quiescence	Quiescence	Final Site Clearance
	Sensitivity	High		
	Magnitude	Very Low	Very Low	Very Low reducing to Zero

Figure 14.17	Viewpoint 10: Fairlie (Allenton Park Terrace)			
	Level of Effect	Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	Moderate / Minor reducing to None and Not Significant
	Type of effect	Medium to Long term, direct and neutral.	Long term, direct and neutral.	Medium to Long term, direct and beneficial.
	Cumulative Level of Effect - Combined	Moderate (due to HNA and the cable manufacturing facility) and Not Significant	Moderate (due to the cable manufacturing facility) and Not Significant	N/A
	Cumulative Level of Effect - Additional	Moderate / Minor and Not Significant	Moderate / Minor and Not Significant	N/A

Table 14C.2 Summary of Cumulative Viewpoint Analysis

Receptor	phase	Sensitivity/ Importance / Value of Receptor	Magnitude of Change	Significance	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
Viewpoint 1: Ayrshire Coastal Path (approach from the east)	Preparations for Quiescence phase	High	High-Medium reducing to Very Low	Major to Major /Moderate and Significant reducing to Moderate/ Minor and Not Significant.	Neutral (retention of building) and Beneficial (removal of buildings)	**Major to Major /Moderate** and Significant reducing to Moderate/ Minor and Not Significant	**Major to Major /Moderate** and Significant (HNA buildings and Proposed Works)
	Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	Moderate/ Minor and Not Significant	**Major to Major /Moderate** and Significant reducing to Moderate/ Minor and Not Significant (Demolition of HNA buildings)
	Final Site Clearance phase	High	High-Medium reducing to Very Low to Zero	**Major to Major /Moderate and Significant** reducing to Moderate/ Minor and None and Not Significant	Adverse (deconstruction activity) to Beneficial (post removal of buildings)	N/A	N/A
Viewpoint 2: Ayrshire Coastal Path (approach from the west)	Preparations for Quiescence phase	High	High-Medium reducing to Low	**Major to Major /Moderate** and Significant reducing to Moderate/ Minor	Neutral (retention of building) and Beneficial (removal of buildings)	**Major to Major /Moderate** and Significant reducing to Moderate/ Minor	**Major to Major /Moderate** and Significant (HNA buildings and Proposed Works)

Receptor	phase	Sensitivity/ Importance / Value of Receptor	Magnitude of Change	Significance	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
				and Not Significant		and Not Significant	
	Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	Moderate/ Minor and Not Significant	**Major to Major /Moderate** and Significant (HNA demolition)
	Final Site Clearance phase	High	High-Medium reducing to Very Low to Zero	**Major to Major /Moderate** and Significant reducing to Moderate/ Minor and Not Significant and None	Adverse (deconstruction activity) to Beneficial (post removal of buildings)	N/A	N/A
Viewpoint 3: Goldenberry Hill	Preparations for Quiescence phase	High	Low reducing to Very Low	Moderate reducing to Moderate/ Minor and Not Significant	Neutral (recladding) to Beneficial (post removal of buildings).	Moderate reducing to Moderate/ Minor and Not Significant	Moderate and Not Significant (Cable facility)
	Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	Moderate/ Minor and Not Significant	Moderate and Not Significant (Cable facility)
	Final Site Clearance phase	High	High-Medium reducing to Very Low to Zero	**Major to Major /Moderate** and Significant reducing to Moderate/ Minor	Adverse (deconstruction activity) to Beneficial (post	N/A	N/A

Receptor	phase	Sensitivity/ Importance / Value of Receptor	Magnitude of Change	Significance	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
				and Not Significant to None	removal of buildings)		
Viewpoint 4: Core Path NC36 near Hunterston Castle	Preparations for Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	No cumulative effects	No cumulative effects
	Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	No cumulative effects	No cumulative effects
	Final Site Clearance phase	High	Low reducing to Zero	Moderate and Not Significant reducing to None	Neutral (during demolition works) to Beneficial (post Site clearance)	N/A	N/A
Viewpoint 5: A78 near junction with Kilrusken Toll	Preparations for Quiescence phase	Medium	Very Low	Minor and Not Significant	Neutral	Minor and Not Significant	Moderate and Not Significant (Cable facility)
	Quiescence phase	Medium	Very Low	Minor and Not Significant	Neutral	Minor and Not Significant	Moderate and Not Significant (Cable facility)
	Final Site Clearance phase	Medium	Low reducing to Zero	Moderate/ Minor and Not Significant reducing to None	Neutral (deconstruction activity) to Beneficial (post	N/A	N/A

Receptor	phase	Sensitivity/ Importance / Value of Receptor	Magnitude of Change	Significance	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
					removal of buildings		
Viewpoint 6: 'The Lion', Great Cumbrae	Preparations for Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	Moderate/ Minor and Not Significant	**Moderate** and **Significant** (Cable facility)
	Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	Moderate/ Minor and Not Significant	**Moderate** and **Significant** (Cable facility)
	Final Site Clearance phase	High	Low reducing to Zero	Moderate reducing to None	Neutral (deconstruction activity) to Beneficial (post removal of buildings	N/A	N/A
Viewpoint 7: Millport, Great Cumbrae	Preparations for Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	Moderate/ Minor and Not Significant	**Moderate** and **Significant** (HNA and Cable facility)
	Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	Moderate/ Minor and Not Significant	**Moderate** and **Significant** (Demolition of HNA buildings and Cable facility)
	Final Site Clearance phase	High	Low reducing to Zero	Moderate reducing to None	Neutral (deconstruction activity) to Beneficial (post removal of buildings	N/A	N/A

Receptor	phase	Sensitivity/ Importance / Value of Receptor	Magnitude of Change	Significance	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
Viewpoint 8: Kaim Hill	Preparations for Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	Moderate/ Minor and Not Significant	Moderate and Not Significant (Cable facility)
	Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	Moderate/ Minor and Not Significant	Moderate/ Minor and Not Significant
	Final Site Clearance phase	High	Very Low reducing to Zero	Moderate/ Minor and Not Significant reducing to None	Neutral (deconstruction activity) to Beneficial (post removal of buildings	N/A	N/A
Viewpoint 9: West Kilbride (Portencross Road)	Preparations for Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	Moderate/ Minor and Not Significant	Moderate and Not Significant (Cable facility)
	Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	Moderate/ Minor and Not Significant	Moderate and Not Significant (Cable facility)
	Final Site Clearance phase	High	Low / Very Low reducing to Zero	Moderate/ Minor and Not Significant reducing to None	Neutral (deconstruction activity) to Beneficial (post removal of buildings	N/A	N/A
Viewpoint 10: Fairlie (Allenton Park Terrace)	Preparations for Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	Moderate/ Minor and Not Significant	Moderate and Not Significant (HNA and Cable facility)

Receptor	phase	Sensitivity/ Importance / Value of Receptor	Magnitude of Change	Significance	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
	Quiescence phase	High	Very Low	Moderate/ Minor and Not Significant	Neutral	Moderate/ Minor and Not Significant	Moderate and Not Significant (HNA and Cable facility)
	Final Site Clearance phase	High	Very Low reducing to Zero	Moderate/ Minor and Not Significant reducing to None	Neutral (deconstruction activity) to Beneficial (post removal of buildings	N/A	N/A

Appendix 14D: LVIA Survey Report

EDF Energy Nuclear Generation Ltd

Decommissioning Hunterston B

Landscape and Visual Survey Report

IEMA
Transforming the world to sustainability
- EIA -

Wood Group UK Limited – May 2022

Report for

EDF Energy Nuclear Generation Ltd
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Document revisions

No.	Details	Date
1	Draft	March 2022
2	Final	May 2022

Contents

1. Introduction

1.1 Purpose of this report

1.1.1 EDF Energy (the Applicant) is developing proposals to decommission Hunterston B Nuclear Power Station, ('the Proposed Scheme'). Wood Group UK Ltd has been contracted by the Applicant to complete the baseline data collection to inform the Environmental Impact Assessment (EIA) for the Proposed Scheme.

1.1.2 This report presents details of the landscape and visual surveys that have undertaken to inform the EIA for the Proposed Scheme. It includes a brief description of the Proposed Scheme, before setting out information about the landscape and visual context derived from both desk and field surveys.

1.2 Site context

1.2.1 The Hunterston B Nuclear Power Station ('the Site') is situated approximately 3.3 km to the north-west of West Kilbride, immediately south of Hunterston Sands on the eastern side of the Firth of Clyde. The centre of the Site is located at approximate National Grid Reference (NGR) NS 184 514.

1.2.2 The majority of the Site is occupied by built structures and hard standing (mainly access roads and car parks). The Site is bound by rough pasture to the north, east and south, with the Hunterston A Nuclear Power Station, which is undergoing decommissioning, to the immediate south-west.

1.3 Scheme description

1.3.1 The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended)[1] (EIADR) require the environmental impact of decommissioning nuclear power stations to be considered. Under EIADR, The Preparations for Quiescent (PfQ) phase of decommissioning activities at Hunterston B, concurrently comprises deplanting, deconstruction, waste processing and Safestore construction, for the purpose of permanently preventing the continued operation of the nuclear power station. Deplanting and deconstruction activities during the PfQ phase, will demolish all buildings to ground level at the Site, excluding the reactor building. The PfQ phase establishes safe conditions for the Quiescent phase; an estimated period of approximately 70 years of relative inactivity, after which Final Site Clearance (FSC) is conducted. The FSC phase involves the re-activity of the site to remove the Safestore, retrieve waste from the debris vaults and complete decommissioning to its end state, so it can be de-licenced.

1.3.2 To facilitate the deplanting and deconstruction in the PfQ phase of decommissioning, new waste processing facilities will be needed on the site which will be delivered by either re-purposing existing buildings or the construction of new buildings, which may be subject to planning approval under the Town and Country Planning (Scotland) Act 1997[2].

1.4 Structure of this report

1.4.1 This Landscape and Visual Survey Report is structured as follows:

[1] The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) (Amendment) Regulations 2018. [Online] Available at: https://www.legislation.gov.uk/uksi/2018/834/made

[2] the Town and Country Planning (Scotland) Act 1997. [Online]. Available at: https://www.legislation.gov.uk/ukpga/1997/8/contents

- **Section 2: Data gathering methodology**: Sets out the sources of data and techniques used in both the desk and field surveys;
- **Section 3: Desk survey findings**: Details the findings of the desk survey utilising published sources of information;
- **Section 4: Field survey findings**.: Includes details of field survey locations and description of the baseline views from the viewpoint locations; and
- **Section 5: Summary and conclusions**.

1.4.2 A number of map-based figures have been prepared to illustrate the baseline context as well as annotated panoramic photographs showing baseline views from viewpoints, the locations of which have been agreed with North Ayrshire Council (NAC) during engagement via email in December 2021. The observations recorded during the field survey at each of the viewpoint locations are included in **Appendix A**.

2. Data gathering methodology

2.1 Overview

Technical guidance

2.1.1 The landscape and visual data collection and record of findings, as presented in this Landscape and Visual Survey Report, have been undertaken in accordance with the third edition of the *Guidelines for Landscape and Visual Impact Assessment*[3] (hereafter referred to as *GLVIA3*). *GLVIA3*[3] is widely regarded by landscape and planning professions as the 'industry standard' together with best practice and professional experience.

2.1.2 Paragraph 3.15 of *GLVIA3*[3] sets out the purpose of baseline studies and requirements and states:

"*The initial step in LVIA is to establish the baseline landscape and visual conditions. The information collected will, when reviewed alongside the description of the proposed development, form the basis for the identification and description of the changes that will result in the landscape and visual effects of the proposal:*

- *For the landscape baseline the aim is to provide an understanding of the landscape in the area that may be affected – its constituent elements, its character and the way this varies spatially, its geographic extent, its history (which may require its own specialist study), its condition, the way the landscape is experienced, and the value attached to it.*
- *For the visual baseline the aim is to establish the area in which the development may be visible, the different groups of people who may experience views of the development, the places where they will be affected and the nature of the views and visual amenity at those points*."

2.1.3 The Landscape and Visual Survey Report also takes account of the technical notes published by the Landscape Institute as follows:

- *Technical Guidance Note 06/19 Visual Representation of Development Proposals*[4]. This provides supplementary guidance to *GLVIA3*[3] as to appropriate techniques to capture site photography and the selection, production and presentation of types of visualisation appropriate to the circumstances in which they will be used.

Study Area

2.1.4 For the purposes of the Landscape and Visual Survey Report, a Study Area consisting of a 5 km offset from the Nuclear Site Licence (NSL) boundary has been defined. The selection of the Study Area has been undertaken in accordance with guidance set out in Sections 5.2 and 6.2 in *GLVIA3*[3] and seeks to ensure that any future LVIA concentrates upon receptors that have the greatest potential to be significantly affected by the Proposed Scheme. The definition of the Study Area has been informed by the extent of the preliminary Zone of Theoretical Visibility map (ZTV) generated for the tallest, long-term component of the Proposed Scheme (i.e. the maximum Safestore structure height which is assumed to be 66.5 m above ground level), described in **Section 2.2** and by the

[3] Landscape Institute and the Institute of Environmental Management and Assessment, (2013). *Guidelines for Landscape and Visual Impact Assessment. 3rd edition*. London. Routledge.
[4] Landscape Institute. (2019). *Technical Guidance Note 06/19 Visual Representation of Development Proposals* [online]. Available at: https://www.landscapeinstitute.org/visualisation/

findings of the desk and field surveys described in **Section 3** and **Section 4**. The Study Area is shown in **Figure 2.1**.

2.2 Desk survey methodology

Summary of data sources

2.2.1 The desk survey has been undertaken with reference to the following principal data sources:

- Ordnance Survey (OS) 1:25,000 scale mapping:
  - Explorer 341 - Greenock, Largs & Millport (or digital mapping);
- Aerial Photography (Google Earth Pro – imagery date April and September 2021) and Street View;
- *SNH National Landscape Character Assessment, Landscape Character Type 59: Raised Beach Coast and Cliffs*[5];
- *SNH National Landscape Character Assessment, Landscape Character Type 61: Coastal Fringe with Agriculture*[6];
- *SNH National Landscape Character Assessment, Landscape Character Type 80: Rugged Moorland Hills and Valleys*[7];
- *Seascape Assessment of the Firth of Clyde*[8];
- *Cylde Muirshiel Regional Park Authority - Park Strategy 2016-2021*[9];
- *North Ayrshire Adopted Local Development Plan*[10]; and
- *North Ayrshire Core Paths Plan*[11].

2.2.2 The baseline description of the Site and its surroundings, as derived from the published sources listed above, is set out in **Section 3**.

Zone of Theoretical Visibility

2.2.3 A preliminary ZTV has been generated to inform the selection of viewpoints from which a photographic record has been obtained. ZTV is defined in *GLVIA3*[3] as "*a map, usually digitally*

[5] Scottish Natural Heritage (SNH) (now Nature Scot). (2019). *National Landscape Character Assessment Landscape Character Type 59*. [online]. Available at: https://www.nature.scot/sites/default/files/LCA/LCT%20059%20-%20Raised%20Beach%20Coast%20and%20Cliffs%20-%20Final%20pdf.pdf

[6] SNH. (2019) *National Landscape Character Assessment Landscape Character Type* 61. [online]. Available at:https://www.nature.scot/sites/default/files/LCA/LCT%20061%20-%20Coastal%20Fringe%20with%20Agriculture%20-%20Final%20pdf.pdf

[7] SNH. (2019). *National Landscape Character Assessment Landscape Character Type* 80. [online]. Available at: https://www.nature.scot/sites/default/files/LCA/LCT%20080%20-%20Rugged%20Moorland%20Hills%20and%20Valleys%20-%20Final%20pdf.pdf

[8] Grant. A & Anderson. C. (2013) *Seascape / Landscape Assessment of the Firth of Clyde - carried out on behalf of the Firth of Clyde Forum*. [online]. Available at: https://www.clydemarineplan.scot/marine-planning/marine-planning-projects/#seascape

[9] Clyde Muirshiel Regional Park Authority. (undated). *Park Strategy 2016-2021*. [online]. Available at: http://clydemuirshiel.co.uk/wp-content/uploads/2016/05/Park-Strategy.pdf

[10] North Ayrshire Council. (2019). *Adopted Local Development Plan*. [online]. Available at: https://www.north-ayrshire.gov.uk/Documents/CorporateServices/LegalProtective/LocalDevelopmentPlan/ldp2.pdf

[11] North Ayrshire Council. (2009). *North Ayrshire Core Paths Plan* [online]. Available at: https://www.north-ayrshire.gov.uk/leisure-parks-and-events/outdoor-activities/core-paths-plan.aspx

produced, showing areas of land within which a development is theoretically visible" [3] and represents the desk top component of the visibility analysis.

2.2.4 The preliminary ZTV was calculated using software that has been developed for use in respect of wind farms together with a Digital Terrain Model (DTM) (OS Terrain 5) and height for the tallest component of the Proposed Scheme i.e. the Safestore (which will house the redundant reactor building) at a maximum height of 66.5 m above ground level (AGL) (based on recladding of the existing reactor building). The DTM represents the topographic constraints on the visual influence of the existing and Proposed Scheme but does not take account of the built elements or vegetation within the Study Area, both of which can significantly reduce the area and extent of actual visibility. In order to take account of the influence of the presence of small to medium sized woodlands within the Study Area, the DTM data has been amended to include areas of woodland as depicted in OS VectorMap District to allow their screening effect to be incorporated in the preliminary ZTV calculation. A conservative height of 12 m AGL has been used for these areas of woodland.

2.2.5 It should be noted that the preliminary ZTV presented in **Figure 2.2** does not include the potential screening effects of other landscape components that may affect visibility, such as buildings, walls, fences, hedgerows or individual trees. An understanding of the role these landscape components play in influencing visibility is therefore obtained during a field survey.

2.3 Field survey methodology

Viewpoint selection criteria

2.3.1 A number of viewpoints have been selected from which a photographic record of existing views has been obtained to inform the assessment. Viewpoint selection has been informed by the desk survey with regard to access and recreation (including promoted walking and cycling routes), tourism including popular vantage points and destinations, and distribution of population. Paragraph 6.20 of *GLVIA3*[3] describes how the selection of viewpoints should take account of a range of factors including:

- "*The accessibility to the public;*
- *The potential number and sensitivity of the viewers who may be affected;*
- *The viewing distance (i.e. short-, medium- and long-distance views) and elevation;*
- *The nature of the viewing experience (for example static views, views from sequential points along routes); and*
- *The view type (for example panoramas, vistas and glimpses).*"

2.3.2 In addition to the criteria list above, viewpoint selection is primarily concentrated on those visual receptors whose activities are influenced by the availability and quality of views (e.g. users of the Ayrshire Coastal Path), or where a sense of place is particularly important to the setting of a settlement, as opposed to those visiting attractions where an appreciation of the landscape is not the primary purpose (e.g. visiting the zoo or an indoor museum). *GLVIA3*[3] describes how viewpoints selected for inclusion fall broadly into three groups as follows:

- "*representative viewpoints, selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ – for example, certain points may be chosen to represent the views of users of particular public footpaths and bridleways;*

- *specific viewpoints, chosen because they are key and sometimes promoted viewpoints within the landscape, including for example specific local visitor attractions, viewpoints in areas of particularly noteworthy visual and/or recreational amenity such as landscapes with statutory landscape designations, or viewpoints with particular cultural landscape associations; and*
- *illustrative viewpoints, chosen specifically to demonstrate a particular effect or specific issues, which might, for example, be the restricted visibility at certain locations"* [3]. This may occur where a highly sensitive visual receptor is shown as coinciding with the ZTV but would not be affected, or conversely where particularly unrestricted views are available.

Viewpoint photography

2.3.3 All photography included within this Landscape and Visual Survey Report has been undertaken in accordance with the specification for Type 4 photography set out in the Landscape Institute's *Technical Guidance Note 06/19: Visual Representation of Development Proposals*[4]. Type 4 uses the highest specification of recording and photographic equipment of the four types defined in *Technical Guidance Note 06/19*[4] and by using this as a basis for the photography, allows flexibility later in the LVIA process when visualisation types are being determined.

2.3.4 All photographs presented in the figures accompanying this Landscape and Visual Survey Report have been taken using:

- A high resolution digital SLR camera with a 'full frame' sensor (i.e. 36 x 24 mm) with the camera set at 1.5 m above ground level[12];
- A 50 mm fixed focal length (prime) lens; and
- A professional quality tripod fitted with a panoramic head.

2.3.5 Accurate locations are established using a hand-held Global Positioning System (GPS) unit and recorded on a standardised proforma. The proforma also allows for other data to be captured as follows:

- The date and time when the viewpoint was visited/photography taken;
- A description of the exact location; and
- Other observational comments regarding the viewpoint location including as to whether relocation was required due to the presence of immediate foreground screening which restricted views in the direction of the development, recording key reference points in the view etc. The proforma also provides a useful record of observations made in relation to landscape condition and perceptual aspects (such as remoteness and tranquillity) which are not always readily available from published sources.

2.3.6 In addition to the viewpoint records, there are a number of other important criteria to consider when obtaining viewpoint photography:

- Ensuring photography is undertaken on a dry, clear day with good visibility (weather and visibility to be recorded on the proforma);
- Ensuring locations are visited from east to west as the day progresses to avoid shooting into the sun and avoiding low sun; and

[12] Scottish Natural Heritage. (2017). *Visual Representation of Wind Farms Guidance Version 2.2*. Paragraph 122. [online]. Available at: https://www.nature.scot/sites/default/files/2019-09/Guidance%20-%20Visual%20representation%20of%20wind%20farms%20-%20Feb%202017.pdf

- Avoidance of foreground clutter in the view.

Field survey

2.3.7 The field survey was completed in February and March 2022 to obtain viewpoint photography at 10 viewpoint locations which were agreed with NAC during engagement via email in December 2021. Photography has been undertaken during the winter months thereby reflecting the maximum visibility scenario. The viewpoint schedule is set out in **Table 4.1** in **Section 4**.

2.3.8 The resultant photographs from the viewpoints have been digitally joined (using Autopano Giga software) to form a panorama and the resultant annotated panoramic photographs have been presented as Type 1 Annotated Viewpoint Photographs in accordance with best practice guidelines set out in the Landscape Institute's *Technical Guidance Note 06/19 Visual Representation of Development Proposals*[4].

2.3.9 A description of the baseline views available from the agreed viewpoint locations is included in **Section 4**.

3. Desk survey findings

3.1 Hunterston B Power Station site

3.1.1 The land within the Hunterston B NSL boundary is sited on a gentle north facing slope which rises from an elevation of approximately 5 m Above Ordinance Datum (AOD) close to the northern boundary of the Site to approximately 25 m AOD at its southern boundary. The area within the boundary predominantly features built form including the large-scale building housing the reactors and adjoining turbine hall, and an expansive range of smaller ancillary buildings, warehouses and tanks. These are set within operational land-uses comprising access roads and service yards all bound by security fencing with a large car park located within the north-western corner of the Site. The remaining areas within the NSL boundary comprise amenity grassland with tree cover limited to occasional sparse belts of vegetation along the southern edge of the reactor building and along the southern perimeter of the Site.

3.2 Wider landscape and visual context

Topography and drainage

3.2.1 The coastal foreshore to the immediate north of the Site is low lying with extensive tidal mudflats at Hunterston and Southannan Sands. This low-lying coastal fringe continues to the north-east of the Site along the eastern edge of the Fairlie Roads, a deep-water channel and arm of the Firth of Clyde, which separates the island of Great Cumbrae from the mainland of North Ayrshire.

3.2.2 Two discrete landforms are present to the immediate south of the Hunterston Nuclear Power Stations; Goldenberry Hill, which rises to an elevation of 140 m AOD and the smaller Campbelton Hill to its east, which reaches an elevation of 76 m AOD. To the west and south-west of Goldberry Hill, the landform remains elevated, from Hawking Craig in the north to Auld Hill, near Portencross, in the south. This area is bounded by an escarpment and cliffs to the west, beyond which, the land falls steeply to the narrow coastal strip below. The topography to the south and south-east of these hills, extending between the coastline and the Ayrshire Coast Rail Line and south towards West Kilbride, is gently undulating at elevations of between 10 m and 35 m AOD. The exception within this general topographical context is the small hill known as Drummilling Hill, located on the northern edge of West Kilbride, which rises to 104 m AOD.

3.2.3 To the east of the Ayrshire Coast Rail Line, the topography rises notably to form the Crosbie Hills which include Glentane Hill (272 m AOD) and the neighbouring Caldron Hill (332 m AOD) and Little Caldron (320 m AOD) which rise above Greenside Hill and Lairdside Hill to the south. Moving northwards, the topography continues to rise to the north of the Glen Burn, to form Kaim Hill which reaches an elevation of 387 m AOD. A series of burns drain the hillsides into the Firth of Clyde.

Land use and vegetation pattern

3.2.4 Beyond the settlements and developed coastline at Hunterston, the lower slopes of the hills and the area between Hunterston and West Kilbride are dominated by improved pasture fields which range in size from smaller fields on the lower slopes of the hills to a large-scale field pattern west of Portencross near West Kilbride. On the upper hillsides and summits of the more elevated land to the east of the Ayrshire Coast Rail Line, the land use of predominantly open moorland grassland with occasional walled field boundaries.

3.2.5 The LVIA Study Area is not particularly wooded. The closest areas of woodland to the Hunterston B Site are those which cover the north and east facing slopes of Goldenberry Hill (Brackenbank, Goldenberry and Hawkingcraig Plantations), the belt of woodland which follows the cliffs south between Hunterston A and Portencross and the pockets of woodland associated with Hunterston Castle and Hunterston House to the east of the Site. Elsewhere within the Study Area, small woodlands are present on the west facing lower slopes of the hills and along the valleys of the burns.

Settlement pattern

3.2.6 Settlement patterns reflect the isolated nature of the coastal landscape and the rising inland topography. Small villages are present along the coastal fringes of the mainland including the town of West Kilbride to the south of the Site and the linear village of Fairlie which spans either side of the A78 to the north-east of Hunterston B. Millport is the only town on the island of Great Cumbrae and forms an arc of settlement around Millport Bay which encompasses the entire south coast of the island. Beyond the main settlements, isolated properties and farmsteads are infrequent within the LVIA Study Area.

3.2.7 Hunterston Port lies to the north and north-east of the Site. This deep-water port comprises a Marine Construction Yard located between Hunterston and Southannan Sands and the Hunterston Ore Terminal, which was once an ore and then a coal importing facility. The facilities closed in 2016 and have been largely dormant since, although the Marine Construction Yard has recently hosted a National Offshore Wind Turbine Test Facility. Now renamed Hunterston Port and Resource Centre (Hunterston PARC), there is an aim, as outlined in the North Ayrshire Adopted Local Development Plan[10] to regenerate the site into an industrial and economic hub.

Recreational routes and destinations

Promoted routes

3.2.8 The Portencross to Largs (Stage 11) section of the Ayrshire Coastal Path, one of Scotland's Great Trails, follows the coastline through the Study Area, passing to the immediate west and north of the Hunterston B NSL boundary as shown on **Figure 3.1**. The Scotland's Great Trails website[13] notes that the coastal path is better walked south to north, as this direction of travel provides better views and puts the prevailing wind behind the walker.

3.2.9 A number of locally promoted routes[14] are also present on Great Cumbrae and coincide with the LVIA Study Area. These include Targets Walk, Fintry Bay Walk, Inner Circle Walk, Cumbrae Cycle Route and Farland Point Walk with sections of all of the routes coinciding with the main road through Millport. With regard to the Farland Point Walk, the Hunterston Nuclear Power Stations are noted in the walk's description which states "*Cast your eye over the mainland, where you will see the Deep Water Terminal (the deepest in Britain) and the Nuclear Power Station at Hunterston. These are backed by Cloudberry Hill and on clear days the Windfarm can be seen on the skyline*."[14]

3.2.10 There are no National or Regional Sustrans Cycle Routes within the Study Area.

[13] Scotland's Great Trials (undated). *Ayrshire Coastal Path.* [Online]. Available at: https://www.scotlandsgreattrails.com/trail/ayrshire-coastal-path/

[14] Ayrshire Paths (undated). *Cumbrae Walks & Cycling*. [online]. Available at: https://www.north-ayrshire.gov.uk/Documents/CorporateServices/LegalProtective/LocalDevelopmentPlan/CumbraeWalks.pdf

Core Paths

3.2.11 The distribution of Core Paths is illustrated in **Figure 3.1**. This shows a network of footpaths primarily concentrated around the coastal fringe.

Transport network

3.2.12 The A78 is the primary transport route in the LVIA Study Area and broadly follows the coastline from Fairlie to Hunterston Roundabout where it deviates from the coastline to follow a more inland route south towards West Kilbride. Here, it meets a number of B classified roads (the B7048, B781, B782 and the B7047) which connect the A78 with the town. The B896 is the only other B classified route in the Study Area and follows a circular route along the coastline of Great Cumbrae. West Kilbride and Fairlie both have railway stations on the Ayrshire Coast Line which connects the Ayrshire Coast with Glasgow. The railway line closely follows the route of the A78 until it reaches a location to the south-east of the Site where is diverges and moves slightly further inland before reaching West Kilbride.

3.3 Landscape character

National Character Areas (NCAs)

3.3.1 The landscape character within 5 km of the Site is classified in the Landscape Character Assessment produced by Scottish Natural Heritage (SNH) (now Nature Scot) in 2019. This published assessment divides the landscape into broad Landscape Character Types (LCTs), the location and geographical extent of which is shown in **Figure 3.2**

3.3.2 The Site and coastal lowland which extends to the north and south are defined as LCT 59 - Raised Beach Coast and Cliffs[5]. The key characteristics of this LCT, as defined by the extant assessment are as follows:

- *"Raised beach, visible as a level shelf backed by a steep, sometimes craggy escarpment representing the former cliff line, above which lies more gently rising land.*
- *Rocky coastline, sometimes with cliffs, with narrow sand and shingle beaches, and mud flats in estuarine locations.*
- *Varied land uses but mainly farmed; the raised beaches also provide a level terrace for settlement and communication.*
- *Large parts of the former cliff line are also characterised by dense, often wind sheared broadleaf woodland.*
- *A number of hillforts, promontory forts, mottes and castles reflecting the strategic importance of this coastal landscape.*
- *Small, historic settlements sit comfortably against the steep former cliff line and use building materials which reflect the local geology.*
- *Some modern growth has taken the form of ribbon development and includes caravan parks and holiday development; tall structures such as masts are relatively few.*
- *Landscape of visual drama and contrast with a strong sense of seclusion, and where less accessible a strong sense of remoteness.*
- *Views tend to be longer distance and focussed seaward."* [5]

3.3.3 To the east of LCT 59, beyond the A78, lies LCT 80 - Rugged Moorland Hills and Valleys. This large area covers a series of rounded hills and moors including the Crosbie Hills closest to the Site. Key characteristics of this LCT are as follows:

- *"Series of rounded hills and moors rising to form a dissected plateau.*
- *Combination of comparatively gentle hills/shallow slopes and steeper craggy escarpments.*
- *Exposed Red Sandstone dykes, sills and intrusions give the moorlands a degree of ruggedness.*
- *Land cover dominated by moorland vegetation, grading from heather and grass moorland, through rough grazing and abandoned pastures to improved pastures on the lower slopes.*
- *Higher moorlands have very extensive areas of coniferous forest.*
- *Field boundaries are marked by drystone dykes, post and wire fences and some hedges on lower slopes.*
- *Some Iron Age hut circles and hill forts occur within the hills and a line of castles mark the boundary with Garnock Valley.*
- *Modern development is generally scarce, comprising little more than a scatter of farmsteads.*
- *Tall structures (masts, pylons and turbines) are beginning to erode some of the characteristics of remoteness from certain areas.*
- *Where woodland does not foreshorten views, they tend to be long distance and panoramic, focused towards the islands and peninsulas in the Firth of Clyde and Kilbrannan Sound".*[7]

3.3.4 To the west of the Site, across the Fairlie Roads, Little Cumbrae Island and Great Cumbrae Island are defined as LCT 61 - Coastal Fringe with Agriculture. The key characteristics of this LCT are as follows:

- "*Low lying coastal fringes*.
- *Varied geology with a variety of sedimentary, igneous and metamorphic rocks.*
- *Agricultural land use with improved pasture and mixed farmland all evident.*
- *Patterns of broadleaf woodland in this landscape closely reflecting the interplay of topography and exposure, together with human land uses.*
- *Contrasting settlement patterns on different islands. Larger settlements within these areas have experienced considerable growth recently with suburban housing developments pushing along the coast and uphill.*
- *Small scale rural character with a fine landscape grain. However, due to their coastal location they are quite exposed and strongly influenced by changing weather conditions.*
- *Views tend to be open, longer distance and focused out to sea towards the mainland and surrounding peninsulas."*[6]

Seascape character

3.3.5 The Seascape/Landscape Assessment of the Firth of Clyde[8] identifies the Site as lying within Section 7, Upper Firth of Clyde and the Cumbraes, and more specifically within Coastal Character Area (CCA) Largs to Goldenberry as shown in **Figure 3.3**. The description of this CCA states "*This stretch of coast, from The Pencil Monument at Largs to the coast below Goldenberry at Hunterston and pivoted on the town of Fairlie, is marked by its strong industrial and recreational relationships with*

the sea, and by the number and extent of infrastructure required to support these activities. The designed landscapes of Kelburn and Hunterston characterise the hinterland. The dominant element of the coast is that the shore has been so heavily modified that little of its natural form remains."[8]

3.3.6 The Seascape/Landscape Assessment of the Firth of Clyde[8] cites the considerations presented in **Table 3.1**, in relation to the key seascape / landscape and visual characteristics of the Largs to Goldenberry CCA.

Table 3.1 Key seascape/landscape and visual characteristics of the Largs to Golenberry CCA

Consideration	Description
Maritime influences and experience from the sea	"*Fairlie Roads is a narrow channel, but it is also one of the deepest sea entrance channels in northern Europe. These narrow seaways around the Cumbraes are a key transition point between the Lower and Upper Firths. The shoreline is largely dominated by imported material that emphasise the need for protection from waves, winds and tides. Yet the close proximity of Little and Great Cumbrae islands provide shelter and reduces the expansiveness of the sea.*" [8]
Maritime development and activity	"*There is frequent maritime activity, with yachts travelling to and from Largs Yacht Haven which has berths for 750 boats. There are additional serviced moorings and covered storage at Fairlie marina. Large vessels berth at Hunterston, the Clydeport deepwater terminal, which is the UK's largest port for importing ore and coal. The mile long gantry with its two travelling gantry cranes reaches out into the Fairle Roads channel.*" [8]
Character and experience of the coastline	"*While much of the coast is modified with a narrow tidal reach, there are large sandy beaches, important for birdlife, at south Fairlie, Gull's Walk and Hunterston Sands revealed at low tide. Most of the coastline between these has been very modified and is protected by rock embankments, paved revetments, rip rap, sea walls and gabion walls. There are extensive areas of reclaimed land. Jetties, piers and headlands project into the sea at regular intervals. Access to much of the shore is difficult and is frequently restricted by security fencing, with the exception of the excellent shoreline access below sea and garden walls at Fairlie. There is a car park and picnic area on headlands to north and south of Fairlie.*" [8]
Topography and land use of hinterland	"*The coast and its immediate hinterland are greatly modified especially where the industrial yards are located at Hunterston. The town of Fairlie sits on a low coastal ledge, with the Clyde Muirshiel Hills, including the prominent Kaim Hill, rising behind. The steep wooded slopes combine pasture with belts of woodland associated with the setting of Kelburn Castle and Country Park. Further policies are associated with Hunterston House. Kelburn windfarm is located behind Fairlie in the Clyde Muirshiel Regional Park. The Ayrshire Coastal path is set back from the coast along part of this stretch.*" [8]
Settlement pattern, built development and infrastructure	"*The only residential settlement is Fairlie, a small village hugging the sweeping bay between two headlands and taking advantage wherever possible of the sea views. The main road and the railway are set back from the coast, with the result that houses extend down to the shore, protected by high sea and garden walls. The area is dominated by the large infrastructure associated with two nuclear power stations, Clydeport terminal, the construction yard and turbine testing station, pylons, the conveyor to the coal railhead and the marinas.*" [8]
Setting of landmarks and features	"*The Hunterston cranes are sculptural landmarks, and the ships moored at their pier are lit at night, creating temporary features. Hunterston B is also lit at night. Kaim Hill's distinctive profile is a landmark on an otherwise unremarkable skyline. The Waste Water Treatment Works, designed to look in keeping as a Victorian red brick building, is located on the former jetty at Fairlie and is a local feature.*" [8]

Consideration	Description
Experience of isolated coast	"*There is no experience of isolation on this coast, which is limited by the amount of development and the sound of activity.*" [8]
Aesthetic qualities	"*The simplicity of Fairlie, with its buildings (including recent residential development), directly fronting the sea creates a settlement of unity and integrity.*" [8]
Visual amenity and key Viewpoints	"*The Ayrshire Coastal Path is a key viewpoint, especially around Hunterston where access by vehicle is not encouraged. The Largs marina provides a promontory viewpoint, as do the headlands to north and south of Fairlie where there are picnic sites. The recognisable profiles of the Cumbraes, Arran and the Cowal hills are visible from this coast, and can be back lit at sunset.*"[8]

3.3.7 Other CCAs within Section 7, Upper Firth of Clyde and the Cumbraes and which lie within the Study Area are as follows:

- Goldenberry to Farland Head;
- Great Cumbrae island;
- Millport; and
- Little Cumbrae island.

3.3.8 South of Farland Head, the coastal edge within the Study Area lies within Section 8 Lower Firth of Clyde (East) and more specially within the Farland Head to Ardrossan Harbour CCA.

3.4 Landscape designations

National landscape designations

3.4.1 There are no national landscape designations (National Parks and National Scenic Areas) within 5 km of the Site.

Regional and local landscape designations

Regional Parks

3.4.2 Regional Parks are a designation that was created to enable the coordinated management of recreation and other land uses, such as farming and forestry, and often include landscapes of regional importance.

3.4.3 The Clyde Muirshiel Regional Park covers an area of 265 sq. km and lies approximately 2 km to the east of the Site at its closest point, as shown in **Figure 3.4**. The overarching objectives of the Park are as follows:

- "*To conserve and enhance the natural beauty. biodiversity and cultural heritage of Clyde Muirshiel Regional Park.*
- *To encourage and enable learning, understanding and enjoyment of Clyde Muirshiel Regional Park.*

- *To promote and foster environmentally sustainable development for the social and economic well-being of the people and communities within the Clyde Muirshiel Regional Park area."*[15]

3.4.4 The Park Strategy 2016-2021[9] notes that the Park Authority "recognises landscape and character as unique assets that contribute to the area's popularity and regional importance. The Park Authority will seek to maintain these assets"[9].

Special Landscape Areas

3.4.5 Special Landscape Areas (SLAs) are areas of locally designated landscape and are protected in North Ayrshire through Policy 15 of the LDP[10]. Whilst the Site does not lie within an SLA, this designation covers both of the islands of Little Cumbrae and Great Cumbrae to the west and a Mainland SLA covers the rising hills and coastline to the north-east, the boundary of which broadly coincides with the Clyde Muirshiel Regional Park. The location and geographical extent of the SLAs within the Study Area is illustrated in **Figure 3.4**.

Wild Land Areas

3.4.6 There are no Wild Land Areas (WLAs) within the 5 km Study Area, the nearest being Waterhead Moor – Muirshiel WLA located approximately 7 km north-east of the Site at its closest point.

3.5 Visual baseline – existing visibility

3.5.1 The Site has relatively low existing visibility due to its low-lying coastal location flanked to the east by the rising landform of the Clyde Muirsheil Regional Park, and to the south by Goldenberry Hill and Campbelton Hill. To the north-east of the Site, there are some views along the coastline looking south to the existing Hunterston A and B buildings beyond disused industrial infrastructure at Hunterston Port and Bulk Terminal. To the west and north-west of the Site, the expanse of sea that forms the Fairlie Roads provides open views from Great Cumbrae and Little Cumbrae. In close range views, areas of woodland and mature trees within the grounds of Hunterston House and Hunterston Castle provide further screening from the east and north-east.

3.5.2 The preliminary ZTV reflects the underlying geology with the main areas of visibility shown to the north-east along the coastline and rising hills, and to the west across the expanse of water to Great and Little Cumbrae. Elsewhere, there would be no visibility of the Proposed Scheme due to the screening by intervening landform, vegetation and / or built-form.

3.6 Future baseline

Overview

3.6.1 Landscape change is an ongoing and inevitable process and would continue across the LVIA study area irrespective of whether the Proposed Scheme proceeds. Change can arise through natural processes (e.g. the maturity of woodlands) and natural systems (e.g. river erosion) or, as is often the case, occurs due to human activity, land use, management or neglect.

[15] Clyde Muirshiel Regional Park [undated] *About Clyde Muirshiel.* [Online]. Available at: https://clydemuirshiel.co.uk/about/about-clyde-muirshiel/

Hunterston A

3.6.2 Hunterston A lies to the immediate south-west of Hunterston B and ceased generating electricity in 1989[16]. It is undergoing the decommissioning process and the twin reactors are contained within two white clad Safestore structures. There will be long-term gradual changes across the Hunterston A site as the decommissioning process continues.

Wider landscape change

3.6.3 Hunterston B is proposed as a Strategic Development Area in the North Ayrshire LDP[10] which states that it would support a variety of uses for the Deep Water Port and identifies the area to the south and east of Hunterston B as 'Marketable Employment Land'. Although timescales for development within these areas are currently unknown, any proposals would alter the landscape around the Site and may increase the number of visual receptors.

3.6.4 Land management, and consequently landscape character, is dependent on the continuation of favourable development management and economic conditions, which is not a matter for this assessment. However, changes to this baseline could alter the landscape character by an increase, decrease or maintenance of current levels of surrounding forestry and other vegetation.

3.6.5 The effects of climate change are similarly difficult to predict at a local level in respect of future change to landscape character.

[16] Magnox (2019). *Our Sites.* [Online]. Available at: https://www.gov.uk/government/collections/our-sites

4. Field survey findings

4.1 Viewpoint locations

4.1.1 The locations from which a photographic record has been obtained is set out in **Table 4.1** and are shown on **Figure 2.2**.

Table 4.1 Viewpoint schedule

Viewpoint (VP) Number	Viewpoint Location	Grid Reference	*GLVIA3*[3] Typology and Selection Justification
VP1	Ayrshire Coastal Path (approach from the east)	E 218825 N 652021	Representative Viewpoint – First opportunity for close-range views available to walkers along the Ayrshire Coastal Path approaching from the north-east.
VP2	Ayrshire Coastal Path (approach from the west)	E 218026 N 651519	Representative Viewpoint – Close range views available to walkers along the Ayrshire Coastal Path approaching from the south and south-west, and views for visitors / staff at the power station.
VP3	Goldenberry Hill	E 218310 N 650329	Representative Viewpoint – Elevated views available to walkers from a recreational location to the south of the Proposed Scheme.
VP4	Core Path NC36 near Hunterston Castle	E 219327 N 651497	Representative Viewpoint – Close range views available to users of Core Path NC36 and visitors and residents at Hunterston Castle, filtered through mature trees.
VP5	A78 near junction with Kilrusken Toll	E 220280 N 650918	Representative Viewpoint – Middle distance views available to drivers and their passengers travelling north along the A78.
VP6	'The Lion', Great Cumbrae	E 217991 N 654920	Specific viewpoint – Marked on OS mapping with car parking and interpretation board. Close to Core Path NC1 within the Great Cumbrae SLA.
VP7	Millport, Great Cumbrae	E 216535 N 654978	Representative Viewpoint – Views available to residents at recreational receptors using the promenade and beach adjacent to 'Crocodile Rock'.
VP8	Kaim Hill	E 222578 N 653241	Specific viewpoint – Summit of a promoted hill walk within Clyde Muirshiel Regional Park.
VP9	West Kilbride (Portencross Road)	E 220158 N 648470	Representative Viewpoint – Views available to residents on the northern edge of West Kilbride and recreational receptors using Core Path NC122.

Viewpoint (VP) Number	Viewpoint Location	Grid Reference	*GLVIA3*[3] Typology and Selection Justification
VP10	Fairlie (Allenton Park Terrace)	E 220835 N 655780	Representative Viewpoint – Views available to recreational receptors using the Ayrshire Coastal Path and beach at Fairlie and to residents on the western edge of the settlement.

4.2 Baseline description

Viewpoint 1: Ayrshire Coastal Path (approach from the east)

4.2.1 This viewpoint is located on the Ayrshire Coastal Path which is aligned along the highway footpath of Power Station Road close to Hunterston Sands. It is sited at a distance of approximately 0.6 km to the north-north-east of the reactor building within Hunterston B at an elevation of 4 m AOD.

4.2.2 The baseline view is illustrated in **Figure 4.1** and shows an open view available to westbound walkers across a foreground comprising highway, highway verge and pastoral grassland separated by a low fence. The reactor building and adjoining turbine hall within Hunterston B are clearly visible as a prominent visual feature extending above Goldenberry Hill to the south of the Site. A number of other lower height ancillary buildings which extend to the north-east and north-west of the reactor buildings of Hunterston B are also evident in the view, either viewed against a backdrop of other larger scale buildings (including the white clad Safestores housing the two reactor buildings of Hunterston A), against the landform of Goldenberry Hill or the more distant hills of the Isle of Arran. An intervening overgrown hedgerow would provide some partial screening of the ancillary buildings to the north-west of the reactor building from this viewpoint in summer months.

Viewpoint 2: Ayrshire Coastal Path (approach from the west)

4.2.3 Viewpoint 2 is located on the Ayrshire Coastal Path which continues to follow the highway footpath of Power Station Road close to Hunterston Sands. It is sited at a distance of approximately 0.5 km to the west-north-west of the reactor building within Hunterston B at an elevation of 4 m AOD.

4.2.4 **Figure 4.2** illustrates the baseline view from this viewpoint and shows an open foreground comprising highway, highway verge and maintained amenity grassland which separates the road from the car park for the power station. The reactor building is clearly visible as a prominent visual feature extending above the Crosbie Hills whilst the adjoining turbine hall and other lower height ancillary buildings which extend to the north of the reactor building, are viewed against a landscape backdrop of the distant hills. The high-voltage, direct current (HVDC) station to the south of the reactor building is also visible against the lower slopes of Goldenberry Hill. The parked cars, lighting columns and low-level buildings all contribute to the visual clutter within this view.

Viewpoint 3: Goldenberry Hill

4.2.5 This viewpoint is located on Goldenberry Hill, to the south of Hunterston B. It is sited at a distance of 1.1km to the south-south-west of the reactor building within Hunterston B at an elevation of 140 m AOD.

4.2.6 The elevated baseline view from Viewpoint 3 is illustrated in **Figure 4.3**. This shows a panoramic view across the redundant Hunterston Port and Resource Centre which extend into the waters of the Fairlie Roads and beyond to Great Cumbrae and along the coastline towards Largs. The top of the reactor building (south-eastern and south-western elevation) is visible as a moderately

prominent built component of the view, sharing its prominence with the surrounding landform, whilst the roof of the adjoining turbine hall is also evident in the view. Very few ancillary buildings within the NSL boundary of Hunterston B are visible from this viewpoint.

Viewpoint 4: Core Path NC36 near Hunterston Castle

4.2.7 Viewpoint 4 is located on Core Path NC36 which follows Old Road to the east of Hunterston Castle. It is sited approximately 0.7 km to the east of the reactor building within Hunterston B, at an elevation of approximately 10 m AOD.

4.2.8 **Figure 4.4** illustrates the baseline view from this viewpoint and shows a view across the grounds to the north of Hunterston Castle towards the walled garden located to the west of the Castle. The corner and top of the south-eastern façade of the reactor building within Hunterston B is partially visible in heavily filtered views through the top of intervening deciduous tree cover in winter conditions and has a very minor visual role. There are no views of any other buildings within the NSL boundary. During the summer months when trees are in full leaf, it is expected that there would be no views of the reactor building within Hunterston B.

Viewpoint 5: A78 near junction with Kilrusken Toll

4.2.9 Viewpoint 5 is located on the A78 near to the junction with Kilrusken Toll. It is sited approximately 1.7 km to the east-south-east of the reactor building within Hunterston B, at an elevation of approximately 20 m AOD.

4.2.10 The baseline view from this route is illustrated in **Figure 4.5**. This shows an open view across agricultural fields with the upper façade of the reactor building within Hunterston B, visible in the middle distance above the pockets of woodland which are present to the east of Hunterston B and which coalesce to provide a belt of continuous tree cover. The turbine hall and the lower height ancillary buildings present within the NSL boundary are not evident in baseline views. The top of the Safestore housing the eastern reactor buildings of Hunterston A is also visible above the tree line with the white clad facade contrasting with surrounding colours in the landscape.

Viewpoint 6: 'The Lion', Great Cumbrae

4.2.11 Viewpoint 6 is located at Lion Rock and close to Core Path NC1 which follows the B896 along the western coastline of Great Cumbrae. The location is a recognised viewpoint on 1:25,000 scale OS mapping with car parking, seating and interpretation board available. It is sited approximately 3.5 km to the north of the reactor building within Hunterston B, at an elevation of approximately 5 m AOD.

4.2.12 **Figure 4.6** illustrates the baseline view from Viewpoint 6 and shows an open coastal view across the Fairlie Roads towards the mainland. The reactor building within Hunterston B forms a clearly identifiable feature in baseline views, partially extending above a landscape backdrop which comprises the lower slopes of Goldenberry Hill. The Safestores housing the two reactor buildings of Hunterston A are visible to the west of Hunterston B with their visual presence emphasised by the white cladding of the structures which contrasts with the darker landscape backdrop of Goldenberry Hill. The turbine hall and lower height ancillary buildings within the Hunterston B NSL boundary as well as the HVDC station to the south of the reactor building are visible as small to very small-scale components of the view and their darker tone helps them to visually recede against the darker colour of the plantation woodlands on the north facing lower slopes of Goldenberry Hill.

Viewpoint 7: Millport, Great Cumbrae

4.2.13 This viewpoint is located just to the south of the B896 Glasgow Street in Millport and close to the coastal promenade, where lines of benches are oriented south to provide views across the Fairlie Roads. It is sited approximately 4 km to the north-north-west of the reactor building within Hunterston B, at an elevation of approximately 5 m AOD.

4.2.14 The baseline view is illustrated in **Figure 4.7**. The foreground of the view comprises a sandy foreshore beyond which the waters of Millport Bay and Fairlie Roads extend towards the mainland. The reactor building within Hunterston B is visible as an identifiable middle-ground component extending above the lower slopes of Goldenberry Hill and the neighbouring Campbelton Hill. The lower height turbine hall and ancillary buildings within the NSL boundary, as well as HVDC station to the south of the reactor building, are visible as small to very small-scale built components against a backdrop of the two referenced landforms and their smaller scale and darker colour, enables these buildings to recede against a landscape background. The Safestores housing the two reactor buildings of Hunterston A are visible to the west of Hunterston B, visible against a backdrop of Goldenberry Hill although their white clad facades emphasise their visual presence.

Viewpoint 8: Kaim Hill

4.2.15 Viewpoint 8 is located of Kaim Hill within Clyde Muirshiel Regional Park and the Mainland SLA. It is sited approximately 4.3 km to the north-east of the reactor building within Hunterston B, at an elevation of approximately 380 m AOD.

4.2.16 **Figure 4.8** illustrates the expansive, panoramic views which are available from this elevated location. The foreground of the view comprises rough grassland (snow covered at the time of the survey), with Little and Great Cumbrae and the distant hill of the Isle of Arran all identifiable landforms in the view, separated by the Fairlie Roads and the Firth of Clyde. The reactor building within Hunterston B is visible as a mid-ground component, viewed against a backdrop of the low-lying coastal strip. The white clad Safestores housing the two reactor buildings of Hunterston A draw the viewer's eye. The elevated nature of the viewpoint has the consequence that many of the lower height ancillary buildings within the Hunterston B NSL boundary as well as the HVDC station to the south of the reactor building are also discernible as small to very small-scale visual components against a landscape backdrop.

Viewpoint 9: West Kilbride (Portencross Road)

4.2.17 This viewpoint is sited on the B7048 Portencross Road on the northern edge of West Kilbride which is identified in the North Ayrshire Core Paths Plan[11] as Core Path NC122 and the West Kilbride Cycle Route. It is located approximately 3.3 km to the south-south-east of the reactor building within Hunterston B, at an elevation of approximately 55 m AOD.

4.2.18 The baseline view is illustrated in **Figure 4.9** and shows a foreground which comprises highway and roadside hedgerow, beyond which lie agricultural fields. The reactor building within Hunterston B is framed by the landforms of Goldenberry Hill and Campbelton Hill and viewed against a landscape backdrop of distant hills. There are no views of Hunterston A or the lower height ancillary buildings within the Hunterston B NSL boundary.

Viewpoint 10: Fairlie (Allenton Park Terrace)

4.2.19 Viewpoint 10 is located on Allenton Park Terrace, approximately 100 m to the south of the public car parking facilities which are available on Pier Road and close to the route of the Ayrshire Coastal Path. It is sited approximately 4.3 km to the north-north-east of the reactor building within Hunterston B, at an elevation of approximately 5 m AOD.

4.2.20 **Figure 4.10** illustrates the baseline view and shows a foreground which comprises a sandy foreshore and Fairlie Road with the Hunterston Ore Terminal pier extending across the water the middle distance. The reactor building within Hunterston B is visible against a landscape backdrop of Goldenberry Hill, with the dark façade of the building helping it to visually recede against the darker tones of the tree cover behind. The Safestores housing the two reactor buildings of Hunterston A are visible to the south of Hunterston B, with their white facades and neighbouring lighter colour buildings to the south drawing the eye and emphasising their visual presence.

5. Summary and conclusions

5.1.1 The landscape and visual baseline set out in this report has been derived from both desk and field surveys. The viewpoints selected illustrate the range in the type of views of the Hunterston B reactor building which are available to visual receptors in the LVIA Study Area including open, coastal views (Viewpoints 1, 2, 6, 7 and 10), filtered views (Viewpoint 4), framed views (Viewpoint 9) and elevated views (Viewpoints 3 and 8). It has allowed the following broad conclusions to be made with regard to the existing visibility of infrastructure within the Hunterston B NSL boundary:

- Of the ten viewpoints from which a photographic record has been obtained, the reactor building is viewed as a skyline feature from four of the viewpoints (Viewpoints 1, 2, 5 and 7). From the remaining viewpoints, the reactor building is viewed either against a landscape backdrop of Goldenberry Hill (as evidenced in Viewpoints 6 and 10), distant hills (Viewpoint 9) or the low-lying coastal fringe/Fairlie Road as illustrated from the elevated Viewpoints 3 and 8.
- Where viewed against the landscape backdrop of Goldenberry Hill, the darker tones of the reactor buildings and many of the lower height ancillary buildings within the NSL boundary, help them to visually recede against the darker tree cover across the north facing slopes of the hill in winter conditions. This is evidenced in Viewpoints 6 and 10 where it becomes more difficult to identify the built form within Hunterston B. In contrast, the white cladding of the Safestores housing the two reactor buildings within Hunterston A, and to a lesser degree, the lighter colour buildings to their south, draw the viewer's eye and emphasise their visual presence in many of the mid to long distance views from within the LVIA Study Area.
- In close distance views from the Ayrshire Coastal Path, the absence of screening around the northern perimeter of the NSL boundary has the consequence that some views feature a degree of visual clutter including parked cars, lighting columns and various sized built form.

Figures

Appendix A
Viewpoint Record Sheets

Viewpoint 1: Ayrshire Coastal Path (approach from the east)		
Camera format: *Digital SLR*	**Camera height**: approx. *1.50m*	**Lens focal length**: *50mm (fixed)*
Date / Time: 04/03/2022 13:20	**GPS**: NS 18825, 52021 **GPS Accuracy**: ~4m	**Weather / visibility**: Sun / some cloud Very good (but looking into sun)
Description of Exact Location: Power Station Road as Hunterston B becomes fully visible on approach from the east (adjacent to Castle ruins on aerial view). On the footpath next to a road sign (40mph / No Stopping).		
Perceptual Qualities (remoteness/sounds/tranquillity): Some traffic, occasional walker - limited sense of remoteness or tranquillity.		
Landscape Condition: Pastural fields in good condition, coastline to the right beyond low stone wall in need of maintenance. No litter evident along road.		

Viewpoint 2: Ayrshire Coastal Path (approach from the west)		
Camera format: *Digital SLR*	**Camera height**: approx. *1.50m*	**Lens focal length**: *50mm (fixed)*
Date / Time: 04/03/2022 14:00	**GPS**: NS 18026, 51519 **GPS Accuracy**: ~4m	**Weather / visibility**: Sun / some cloud Very good
Description of Exact Location: South of main entrance / roundabout and opposite main car park. On the footpath where fencing comes to a 'point' following the curve in the road.		
Perceptual Qualities (remoteness/sounds/tranquillity): Some traffic, occasional staff – very limited sense of remoteness or tranquillity.		
Landscape Condition: Industrial setting but well-maintained buildings, although empty compounds adjacent to coastline away from main complex. Some litter caught in fences.		

Viewpoint 3: Goldenberry Hill		
Camera format: *Digital SLR*	**Camera height**: approx. *1.50m*	**Lens focal length**: *50mm (fixed)*
Date / Time: 04/03/2022 13:20	**GPS**: NS 18310, 50329 **GPS Accuracy**: ~4m	**Weather / visibility**: Sun / some cloud Very good
Description of Exact Location: At the cairn at the summit of Goldenberry Hill.		
Perceptual Qualities (remoteness/sounds/tranquillity): Workmen at adjacent communication tower - maritime activity visible and coastal settlements as well as nearby road, although some sense of remoteness and tranquillity.		
Landscape Condition: Natural rough grassland and scrub typical of uplands, but dilapidated stone walling near summit. No litter evident.		

Viewpoint 4: Core Path NC36 near Hunterston Castle		
Camera format: *Digital SLR*	**Camera height**: approx. *1.50m*	**Lens focal length**: *50mm (fixed)*
Date / Time: 04/03/2022 13:20	**GPS**: NS 19327, 51497 **GPS Accuracy**: ~5m	**Weather / visibility**: Sun / some cloud Very good
Description of Exact Location: Core Path in gap between the castle and the hedgerow.		
Perceptual Qualities (remoteness/sounds/tranquillity): Occasional cyclists and walkers on path, some activity at the castle. Some sense of remoteness and tranquillity.		
Landscape Condition: Well maintained garden grounds and fence lines.		

Viewpoint 5: A78 near junction with Kilrusken Toll		
Camera format: *Digital SLR*	**Camera height**: approx. *1.50m*	**Lens focal length**: *50mm (fixed)*
Date / Time: 23/03/2022 12:05	**GPS**: NS 20280, 50918 **GPS Accuracy**: ~4m	**Weather / visibility**: Sun - but haze preventing long distance views Good to average
Description of Exact Location: Adjacent to bollard to the north of the Kilrusken Toll junction.		
Perceptual Qualities (remoteness/sounds/tranquillity): Busy 'A' road with cars / lorries approaching and passing at speed - little sense of remoteness and tranquillity.		
Landscape Condition: Improved grassland / pastural fields, with some scrub at boundaries – generally in good condition. Maintained hedgerows and avenues of trees. Tall ruderal vegetation beyond roadside verge with some litter.		

Viewpoint 6: 'The Lion', Great Cumbrae		
Camera format: *Digital SLR*	**Camera height**: approx. *1.50m*	**Lens focal length**: *50mm (fixed)*
Date / Time: 04/03/2022 15:40	**GPS**: NS 17991, 54920 **GPS Accuracy**: ~4m	**Weather / visibility**: Sun / some cloud Very good
Description of Exact Location: Formal layby with interpretation board - next to interpretation board.		
Perceptual Qualities (remoteness/sounds/tranquillity): Occasional cars, cyclists, walkers on road, maritime activity although some sense of remoteness and tranquillity.		
Landscape Condition: Semi-natural coastline, some sign of ageing on interpretation board, broken glass, aging picnic benches.		

Viewpoint 7: Millport, Great Cumbrae		
Camera format: *Digital SLR*	**Camera height**: approx. *1.50m*	**Lens focal length**: *50mm (fixed)*
Date / Time: 04/03/2022 15:20	**GPS**: NS 16535, 54978 **GPS Accuracy**: ~4m	**Weather / visibility**: Sun / some cloud Very good
Description of Exact Location: Between the pavement and promenade behind westernmost bench immediately northwest of 'the crocodile' tourist attraction.		
Perceptual Qualities (remoteness/sounds/tranquillity): Cars, cyclists, walkers on road, maritime activity, beach walkers. Very little sense of remoteness and tranquillity.		
Landscape Condition: Coastal tourist destination well maintained beaches and facilities.		

Viewpoint 8: Kaimes Hill		
Camera format: *Digital SLR*	**Camera height**: approx. *1.50m*	**Lens focal length**: *50mm (fixed)*
Date / Time: 25/02/2022 10:35	**GPS**: NS 22578, 53241 **GPS Accuracy**: ~7m	**Weather / visibility**: Sun / some cloud and haze in distance Very good to Good
Description of Exact Location: On distinctive ridge / false summit on path to the west of the summit (no view from trig point at summit).		
Perceptual Qualities (remoteness/sounds/tranquillity): Quite remote and tranquil – some maritime activity visible and settlement.		
Landscape Condition: Upland grasses and heather in good condition.		

Viewpoint 9: West Kilbride (Portencross Road)		
Camera format: *Digital SLR*	**Camera height**: approx. *1.50m*	**Lens focal length**: *50mm (fixed)*
Date / Time: 04/03/2022 11:20	**GPS**: NS 20158, 48470 **GPS Accuracy**: ~7m	**Weather / visibility**: Sun / some cloud Very good
Description of Exact Location: Portencross Road next to driveway to no 23 (on manhole cover).		
Perceptual Qualities (remoteness/sounds/tranquillity): Cars, cyclists, buses on road, walkers on adjacent pavement. Very little sense of remoteness and tranquillity.		
Landscape Condition: Hedgerow and field well maintained.		

Viewpoint 10: Fairlie (Allenton Park Terrace)		
Camera format: *Digital SLR*	**Camera height**: approx. *1.50m*	**Lens focal length**: *50mm (fixed)*
Date / Time: 25/02/2022 9:15	**GPS**: NS 20835, 55780 **GPS Accuracy**: ~7m	**Weather / visibility**: Sun / some cloud and haze in distance Very good to Good
Description of Exact Location: At the northern corner of Allenton Park Terrace at 'Private Road' sign.		
Perceptual Qualities (remoteness/sounds/tranquillity): Beach walkers, cars nearby, settlement. Not remote, beach sounds (water, seagulls).		
Landscape Condition: Urban edge well maintained.		

Appendix 14E: Indirect Effects on Coastal Character Areas

November 2023

Appendix 14E
Indirect effects on Coastal Character Areas

14E.1 Introduction

14E.1.1 The indirect effects of the Proposed Works on three Coastal Character Areas (CCAs) within the Study Area are assessed in **Table 14E.1** below. These character areas were identified as having the potential for significant effects in **Table 14.9** of the Landscape and Visual Impact Assessment (LVIA) in **Chapter 14: LVIA**.

14E.1.2 The sensitivity of all three CCAs is assessed as *High-Medium*. This reflects a shared medium susceptibility to change from the Proposed Works due to the medium and smaller scale seascape areas and the directional focus of views which include a large range of foci including existing infrastructure at HNB and HNA. All of the CCAs are locally designated as Special Landscape Areas (SLAs) and the value of the CCAs is judged as High-Medium.

Table 14E.1 Indirect effects on seascape / coastal character

Great or Big Cumbrae island CCA
This CCA spans the coastline of Great or Big Cumbrae with the exception of Millport Bay. It is characterised as an irregular coastline *'… with red sandstone rocks interspersed with beaches that are generally small. The raised beach behind the shore varies in width, narrowing where low wooded ridges of pale igneous rock reach the coast*'. The key characteristics of this CCA are described on page 37 in the *Seascape/Landscape Assessment of the Firth of Clyde – Section 7 – Upper Firth of Clyde and the Cumbraes* document. ZTV coverage indicates theoretical visibility of the Proposed Works predominantly to the south and south-east of the island. Views from this area are illustrated in Viewpoint 6 (see **Figure 14.13**). The coastline in this area is of a smaller scale with views orientated across Fairlie Roads towards the mainland. As shown in Viewpoint 6 the coastline is generally rocky interspersed with areas of pebble shoreline and seaweed in small bays. The hinterland is mostly deciduous scrub with some areas of agricultural land – particularly to the west of Millport Bay. Access is generally gained by local residents and visitors to the island from the B896 which circumnavigates the island along the coastline and a small number of water-based users accessing Keppel Pier. Assessment: *Preparations for Quiescence phase:* The Proposed Works will be visible in views across Fairlie Roads to the south and south-east from the southern / south-east area of the coastline and would appear at a

minimum distance of approximately 2.5 km as minor activity in distant, often oblique, views. As a result, the Proposed Works would appear in a different seascape area, in a low-lying location towards the background of views. The Proposed Works would be set down from the skyline ridges in an area influenced by industrial activity and maritime movement, however, would be seen adjacent to HNA which are noticeable focal points in the view in this direction. Due to the low lying nature of the Proposed Works, dismantling activity would be barely perceptible from this location. Supporting infrastructure is likely to re-purpose existing buildings, but in the instance of requiring new structures it is intended that these will occupy the location of existing low-lying buildings and would not be discernible in the view. The Safestore will occupy the same footprint as the existing reactor building and will maintain the same height as the existing building. As a result, the Proposed Works will not alter the key characteristics of the overall *Great or Big Cumbrae island* CCA. From the majority of the CCA to the north of the Study Area, there will be no visibility of the Proposed Works. Where visible, the magnitude of change will be Very Low resulting in a **Moderate / Minor to Minor**, neutral and Not Significant effect. The nature of these effects would be temporary, medium-term, and indirect. The magnitude of change at the end of the Preparations for Quiescence phase would be Very Low resulting in a **Moderate / Minor to Minor**, beneficial due to a reduction in building mass to neutral due to the continued presence of the Safestore building and Not Significant effect. The nature of the effects se effects would be permanent, and indirect.

Cumulative Effects: Preparations for Quiescence Phase:

The existing HNA Safestores are located immediately adjacent to the Proposed Works at ~0.3 km from the HNB reactor building and form two visible, tall elements in the landscape due to their white cladding which contrasts highly with surrounding features and draws the eye. Although tall, they do not break the skyline of the view from this CCA. The magnitude of change from the HNA Safestores and associated buildings is Low.

The high voltage sub-sea cable factory occupying the former Ore / coal Terminal would introduce large low lying industrial buildings and a 185 m tower onto the reclaimed platform area and would potentially increase views of maritime activity during the Preparations for Quiescence Phase. The tower would be visible on the skyline and would act as a focal point in views from *Great or Big Cumbrae Island* CCA. The magnitude of change would be Medium.

The additional effect of the Proposed Works would lead to a Very Low magnitude and a **Moderate / Minor to Minor** and Not Significant effect.

The combined coastal effect would be **Moderate to Moderate / Minor**, adverse and Not Significant. The nature of these effects would be long-term, cumulative, and indirect.

Quiescence Phase:

During the Quiescence phase, supporting infrastructure such as the waste processing facilities will have been dismantled and the Safestore would remain in situ. The magnitude of change would remain Very Low resulting in a **Moderate / Minor to Minor**, beneficial to neutral and Not Significant effect. The nature of these effects would be long-term, and indirect.

Great or Big Cumbrae island CCA

Cumulative Effects: Quiescence Phase:
As part of the HNA FSC, the HNA Safestore buildings will be demolished approximately 25 years before the end of the Quiescence period. This would reduce the massing of built form adjacent to the HNB Nuclear Site Licence Boundary (the Site) and remove the white-clad buildings that form a focal point in views along the coastline. . The magnitude of change from HNA would be Low during demolition activity stages reducing to Zero after the Site is cleared.
The magnitude of change from the Cable Factory would remain Medium reducing to Zero following decommissioning, which is anticipated in approximately 2050.
The additional effect of the Proposed Works would be Very Low magnitude resulting in a **Moderate / Minor to Minor**, neutral and Not Significant level of effect.
The combined landscape effect would be Medium magnitude and a **Moderate to Moderate / Minor**, adverse and Not Significant effect. The nature of these effects would be long-term, cumulative, and indirect.

Final Site Clearance phase:
Increased site activity would occur during this phase, following on from the Quiescence phase. All of the built elements on the Site would be removed and, although a brownfield site, the Indicative Dismantling Works Area (Works Area) would appear as re-integrated into its natural surroundings from this distance. The removal of built elements and re-integration of the Works Area into the surrounding seascape would affect a small part of the views from the CCA. This would result in a Very Low magnitude of change reducing to Zero as the Works Area is re-integrated, such that the Proposed Works would contribute to a **Moderate / Minor**, neutral and Not Significant effect during dismantling and deconstruction reducing to **None** and beneficial thereafter. The nature of these seascape effects would be temporary during this phase and permanent thereafter, and indirect.

Millport CCA

Only a small part of this CCA is included within the Study Area and this does not face the Proposed Works. As a precautionary measure the CCA is included due to the main orientation of the bay towards the Proposed Works. The shoreline is characterised as *'…a series of sandy beaches separated by low rocky sills and promontories, and the typical promenade of a resort with a large number of "dedicated" seats. Islands in the bay, together with Wee Cumbrae close by, create shelter. The town is a popular holiday resort known for its "illuminations".'*. The key characteristics of this CCA are on page 42 in the *Seascape/Landscape Assessment of the Firth of Clyde – Section 7 – Upper Firth of Clyde and the Cumbraes* document. The CCA notes under Views that "*the promenade, esplanade and at the pier which gives more panoramic views. The tilted terraces, Castle, Old and New Lighthouses of Little Cumbrae island, together with the serrated skyline of the Isle of Arran, are significant features in views from the bay, as is the development at Hunterston*."

ZTV coverage indicates theoretical visibility of the Proposed Works across the majority of this CCA with the exception of the eastern section where visibility would be screened by headlands. Views from this area are illustrated in Viewpoint 7 (**Figure 14.14**). The curved coastline in this area is of a medium scale with views orientated south across Fairlie Roads towards Little Cumbrae the mainland at Hunterston. Small islands (the Eileans, The Leug and The Spoig) are scattered within the bay and form middle distance features. As shown in Viewpoint 7 the coastline comprises a sandy beach with exposed rocky features. The hinterland comprises a promenade, road, houses, shops, hotels, golf course and caravan site beyond which the landform rises steeply to enclosed grazing fields and pockets of woodland. Millport is a popular tourist resort and access is gained from the town and promenade by both locals and visitors.

Assessment:
Preparations for Quiescence Phase:
The Proposed Works will be visible in views across Fairlie Roads to the south of the bay and would appear at distances of between approximately 3 km - 3.8 km adjacent to the Safestore and adjacent HNA buildings, which form background focal features on the mainland. From this location, the Safestore is visible on the skyline of the view, as shown in **Figure 14.14**. Due to the low-lying nature of the Proposed Works, dismantling activity will be barely perceptible from this location. The Safestore will occupy the same footprint as the existing reactor building and will maintain the same height as the existing building and will be visible alongside the HNA buildings and, as a result, will not present as a new, unfamiliar feature in the view. The Proposed Works will not alter the key characteristics of the overall CCA and there will be no visibility of the Proposed Works from the eastern flank of the bay. Where visible, the magnitude of change during deconstruction works will be Zero at the beginning of the works to Very Low resulting in a **None to Moderate / Minor to Minor**, neutral and Not Significant effect. The nature of the effects would be temporary to medium term, indirect and neutral to beneficial. The magnitude of change at the end of the Preparations for Quiescence phase would be Very Low resulting in a **Moderate / Minor to Minor** Not Significant effect that would be beneficial due to a reduction in building mass, to neutral due to the continued presence of the Safestore building. The nature of the effects would be permanent, and indirect.

Millport CCA

Cumulative Effects: Preparations for Quiescence Phase:
The existing HNA Safestores are located immediately adjacent to the Proposed Works at ~0.3 km from the HNB reactor building and form two visible, tall elements in the landscape due to their white cladding which contrasts highly with surrounding features and draws the eye. Although tall, they do not break the skyline of the view from this CCA. The magnitude of change from the HNA Safestores and associated buildings is Low.
The cable factory would introduce large low lying industrial buildings and a 185 m tower onto the reclaimed platform area and would potentially increase views of maritime activity during the Preparations for Quiescence Phase. The tower would be visible on the skyline and would act as a focal point in views from *Millport* CCA. The magnitude of change would be Medium.
The additional effect of the Proposed Works would lead to a Very Low magnitude and a **Moderate / Minor to Minor** and Not Significant effect.
The combined landscape effect would be **Moderate to Moderate / Minor** and Not Significant. The nature of these effects would be long-term, cumulative, indirect and neutral to beneficial.

Quiescence Phase:
During the Quiescence phase, the processing and storage units alongside the Safestore would have been removed and there would be little activity in the view. The magnitude of change would remain Very Low resulting in a **Moderate / Minor to Minor**, beneficial to neutral and Not Significant effect. The nature of these effects would be long-term, and indirect.

Cumulative Effects: Quiescence Phase:
As part of the HNA FSC, the HNA Safestore buildings will be demolished approximately 25 years before the end of the Quiescence phase. This would reduce the massing of built form adjacent to the Site and remove the white-clad buildings that form a focal point in views from *Millport* CCA. The magnitude of change from HNA would be Low during the demolition activity stage reducing to Very Low to Zero after the Site is cleared.
The magnitude of change resulting from the introduction of theCable Factory would remain Medium reducing to Zero following decommissioning, which is anticipated in approximately 2050.
The additional effect of the Proposed Works would lead to a Very Low magnitude and a **Moderate / Minor to Minor**, neutral and Not Significant level of effect.
The combined landscape effect would be Low to Zero magnitude and **Moderate to Moderate / Minor**, adverse, and Not Significant effect reducing to **None**. The nature of these effects would be long-term, cumulative, and indirect.

Final Site Clearance phase:
Increased site activity would occur during this phase, following on from the Quiescence phase. All of the built elements on the Site would be removed and, although a brownfield area, the Works Area would be re-integrated into its natural surroundings. The removal of built elements and re-integration of the Works Area into the surrounding seascape would affect a "*significant feature in views*" from the CCA. This would result in a Low magnitude of change, such that the Proposed Works would contribute to a **Moderate to**

Millport CCA

Moderate / Minor, adverse and Not Significant effect during the dismantling and deconstruction works. Although a significant feature in the view, the removal of the Safestore would be beneficial following the removal of the Safestore. The nature of these seascape effects would be temporary during this phase and permanent thereafter, and indirect.

Little Cumbrae or Wee Cumbrae island CCA

This CCA is covers the coastline of Little Cumbrae. The shoreline is characterised as a small island '*…with a rocky shoreline, and a series of smaller islands along the east facing shore. The shoreline is characterised by dramatic cliffs and large boulders which make access to the foreshore difficult. A wave cut platform forms a skirt around some of the island at low tide, backed by cliffs that form a backdrop to the imposing Little Cumbrae House on the east coast.*' The key characteristics of this CCA are on page 46 in the *Seascape/Landscape Assessment of the Firth of Clyde – Section 7 – Upper Firth of Clyde and the Cumbraes* document.

ZTV coverage indicates theoretical visibility of the Proposed Works from the east facing parts of this CCA.

The coastline in this area is of a small scale with views east orientated across Fairlie Roads towards the mainland at Hunterston. Small islands (Broad Islands, Castle Island and Trail Isle) are scattered to the east and form close to middle distance features. The coastline to the east is characterised by a narrow rocky shoreline with low lying wave cut platforms providing access. The hinterland comprises a series of tilted terraces to 123 m AOD. Landcover comprises scrub, bracken and low trees with semi-rough grassland on the hill top. An escarpment backs the shore on the east coast. The island is privately owned and access is difficult without prior arrangement.

Assessment:
Preparations for Quiescence Phase:
The Proposed Works will be visible across Fairlie Roads in views east and appear at a distance of approximately 2.8 km adjacent to the Safestore and adjacent infrastructure of HNA, which collectively form background focal features on the mainland. Due to the low-lying nature of the Proposed Works, and intervening islands in views east, dismantling activity (including the jetty) would be barely perceptible from most parts of the CCA. The processing buildings for demolition would be low-lying and would reuse existing buildings where possible. The Safestore will occupy the same footprint as the existing reactor building and will maintain the same height as the existing building. The waste processing facilities and Safestore will be visible and, as a result, will not present as a new, unfamiliar feature in the view. As a result, the Proposed Works will not alter the key characteristics of the overall CCA and there will be no visibility of the Proposed Works from the western and northern parts of the CCA. Where visible, the magnitude of change will be Zero at the beginning of the works to Very Low resulting in a **None** to **Moderate / Minor to Minor**, neutral and Not Significant effect. The nature of the effects would be temporary to medium term, indirect and neutral to beneficial. The magnitude of change at the end of the Preparations for Quiescence phase would be Very Low resulting in a

Little Cumbrae or Wee Cumbrae island CCA

Moderate / Minor to Minor, beneficial due to a reduction in building mass, to neutral due to the continued presence of the Safestore building and Not Significant effect. The nature of the effects would be permanent, and indirect.

Cumulative Effects: Preparations for Quiescence Phase:
The existing HNA Safestores are located immediately adjacent to the Proposed Works at ~0.3 km from the HNB reactor building and form two visible, tall elements in the landscape due to their white cladding which contrasts highly with surrounding features and draws the eye. Although tall, they do not break the skyline of the view from this CCA. The magnitude of change from the HNA Safestores and associated buildings is Low.
The high voltage sub-sea cable factory occupying the former Ore / coal Terminal would introduce large low lying industrial buildings and a 185 m tower onto the reclaimed platform area and would potentially increase views of maritime activity during the Preparations for Quiescence Phase. The tower would be visible on the skyline and would act as a focal point in views from *Little or Wee Cumbrae* CCA. The magnitude of change would be Medium.
The additional effect of the Proposed Works would lead to a Very Low magnitude and a **Moderate / Minor to Minor**, neutral and Not Significant effect.
The combined landscape effect would be **Moderate to Moderate / Minor**, adverse and Not Significant. The nature of these effects would be long-term, cumulative, and indirect.

Quiescence Phase:
During the Quiescence phase, the processing and storage units would have been removed and there would be little activity in the view. The magnitude of change would remain Very Low resulting in a **Moderate / Minor to Minor** and Not Significant effect. The nature of these effects would be long-term, indirect and beneficial to neutral.

Cumulative Effects: Quiescence Phase:
As part of the HNA FSC, the HNA Safestore buildings will be demolished approximately 25 years before the end of the Quiescence phase. This would reduce the massing of built form adjacent to the Site and remove the highly visible white-clad buildings that form a focal point in views from *Little or Wee Cumbrae Island* CCA. The magnitude of change from HNA would be Low, adverse during the demolition activity stage reducing to Very Low to Zero and beneficial after the Site is cleared.
The magnitude of change resulting from the introduction of the Cable Factory would remain Medium reducing to Zero following decommissioning, which is anticipated in approximately 2050.
The additional effect of the Proposed Works would lead to a Very Low magnitude and a **Moderate / Minor to Minor**, neutral and Not Significant level of effect.
The combined landscape effect would be **Moderate to Moderate / Minor**, adverse and Not Significant. The nature of these effects would be long-term, cumulative, and indirect.

Final Site Clearance phase:
Increased site activity would occur during this phase, following on from the Quiescence phase. All of the built elements on the Site would be removed and, although a brownfield

Little Cumbrae or Wee Cumbrae island CCA

area, the Works Area would be re-integrated into its natural surroundings. The removal of built elements and re-integration of the Works Area into the surrounding seascape would affect a distant focal feature in views from the CCA. This would result in a Very Low to Zero magnitude of change reducing to Zero as the Works Area is re-integrated into the surrounding landscape, such that the Proposed Works would contribute to a **Moderate**, adverse and Not Significant effect during the dismantling and deconstruction works reducing to **None** and beneficial as the Works Site is integrated into the surrounding landscape. The nature of these seascape effects would be temporary during this phase and permanent thereafter, and indirect.

Appendix 14F: Effects on Visual Receptors

Appendix 14F
Effects on Visual Receptors

14F.1 Introduction

14F.1.1 The effects of the Proposed Works on visual receptors within the Study Area are assessed in this appendix. The visual receptors are identified as having the potential for significant effects in **Table 14.9** of the Landscape and Visual Impact Assessment (LVIA) in **Chapter 14: LVIA** and include:

- Visual effects on views from Settlements and residential properties;
- Visual effects on views from Transport Routes;
- Visual effects on views from Recreational Routes; and,
- Visual effects on views from Recreational and Tourist Destinations

Visual effects on views from Settlements and residential properties

14F.1.2 The visual effects likely to be experienced from settlements include consideration of residential areas, the public realm and public open spaces within the settlement boundaries that would be frequented by people. The effects on settlements within the Study Area that overlapped by Zone of Theoretical Visibility (ZTV) are assessed in **Table 14F.1**.

14F.1.3 The sensitivity of each of these receptors (people) at settlements has been assessed as *High*.

14F.1.4 Millport is the only settlement within the 3km Study Area. Although only part of the settlement is within the Study Area, the entirety of the settlement is assessed as a precautionary measure. Other settlements including Fairlie and West Kilbride are located outwith the 3 km Study Area. Viewpoint analysis of Fairlie (Viewpoint 10) and West Kilbride (Viewpoint 9) indicate a **Very Low** magnitude of change that would not lead to significant effects as a result of the Proposed Works as evidenced in **Appendix 14C**.

14F.1.5 In summary, there would be no significant effects on the views from Millport.

14F.1.6 Scattered residential receptors within 1 km of the Proposed Works are very limited but include Hunterston House, Hunterston Castle, Campbelton Farm, and a cluster of residential properties at Thirdpart. ZTV analysis shows that there would be very limited theoretical visibility from these properties due to screening from intervening landform and / or woodland. This was verified on site visits. The level of effect from these properties would not be significant. This is further illustrated by viewpoint analysis of Hunterston Castle (Viewpoint 4) which illustrates the nature of the heavily filtered views through woodland in **Figure 14.11** and assesses a **Very Low** magnitude of change during the Preparations for Quiescence and Quiescence phases and a **Low** magnitude of change during the Final Site Clearance. These magnitudes are repeated in an assessment of the effects of the Proposed Works on the Core Path 111 at Thirdpart in **Table 14F.3**. The effects of the Proposed Works on scattered residential properties within 1 km are therefore not considered further in this assessment.

Table 14F.1 Visual effects on views from Settlements

Settlement: Millport

The settlement of Millport is located on Great Cumbrae Island at approximately 3 km to the north-north-west at its closest point. The main part of the settlement curves around Millport Bay and overlooks the beach with more distant views across Fairlie Roads towards the mainland and Little Cumbrae Island.

ZTV coverage indicates theoretical visibility across the majority of the settlement, with the exception of eastern flank of the bay where views would be screened by landform at Fairlie Point. The effects on views from the settlement are assessed in Viewpoint 7, **Appendix 14C**, **Table 14C.2**.

In summary:

- The Preparations for Quiescence phase would result in a **Moderate / Minor**, neutral and Not Significant level of effect;
- The Quiescence phase would result in a **Moderate / Minor**, neutral and Not Significant level of effect; and
- The Final Site Clearance phase would result in a **Moderate**, adverse and Not Significant effect reducing to None and beneficial at the end of the Final Site Clearance phase.

Cumulative Assessment:
The HNA (Preparations for Quiescence phase) would result in a **Low** magnitude of change.
The HNA Final Site Clearance (Quiescence phase) would result in a **Low** magnitude of change, reducing to Zero after the Site is cleared.
The consented cable factory would result in a **Medium** magnitude of change (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (Additional):
The additional effects from the Proposed Works would be **Moderate / Minor**, neural and Not Significant (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (Combined):
The combined cumulative effect would be **Moderate**, adverse and Significant (due to the cable factory and HNA, and not the Proposed Works).

Visual effects on views from Transport Routes

14F.1.7 **Table 14F.2** details the visual effects on views of the Proposed Works from the transport routes within the Study Area.

14F.1.8 The views from these routes would be experienced transiently by road users (mainly drivers and where appropriate cyclists and walkers) who would experience the Proposed Works as part of the changing sequence of views experienced from the route. Each of these routes were driven or travelled in both directions in order to assess the potential effects and each assessment has been assisted on-site with the use of sequential wirelines transects and ZTV maps.

14F.1.9 In summary, there would be significant visual effects from Power Station Road which is partially located within the Works Area and is the main access to the Site. Mitigation planting delivered as part of the ISLP (see **Appendix 14G)** within the Works Area would provide further screening for receptors accessing Power Station Road during the Quiescence and Final Site Clearance phases. There would be no significant effects from other surrounding transport routes from the Proposed Works due to intervening distance and screening from intervening trees and landform. Significant cumulative visual effects would occur as a result of other developments including the introduction of the cable factory in views from Oilrig Road, Fairlie Moor Road and the B896. Significant cumulative visual effects are also assessed at Oilrig Road for the Final Site Clearance Phase of HNA.

Table 14F.2 Visual effects on views from Transport Routes

A78

Within the Study Area, the A78 is routed from West Kilbride in the Southannan Roundabout to the south of Fairlie in the north. Viewpoint 5 is located along this route. The route does not pass through a Nationally or Locally designated landscape within the Study Area and is not designated as a tourist route. The value of the route is therefore assessed as **Medium**. The susceptibility to change from the introduction of the Proposed Works is considered to be **Low** and the overall sensitivity of this route is therefore assessed as *Medium*.

Travelling north from West Kilbride, ZTV coverage indicates theoretical visibility as the route leaves the settlement, however, roadside buildings and vegetation would screen views of the Proposed Works (Zero magnitude). There would be no views of the Proposed Works until east of Carlung House where the ZTV indicates theoretical visibility for ~400 m, however, belts of mature trees north of Carlung House screens views. Further ZTV coverage is indicated between Highthorn Bridge and south of Hunterston Roundabout (~1.5 km) where there would be oblique views of Proposed Works affecting the reactor building which is visible above a line of trees as described in the assessment of Viewpoint 5 in **Appendix 14C**, **Table 14C.2**. There would be no further theoretical visibility along the route within the Study Area.

The effects for the ~1.5 km of visibility within the Study Area are summarised in Viewpoint 5 as:
The Preparations for Quiescence phase would result in a **Minor**, beneficial to neutral and Not Significant level of effect;
The Quiescence phase would result in a **Minor**, beneficial to neutral and Not Significant level of effect; and
The Final Site Clearance phase would result in a **Moderate**, neutral and Not Significant effect during dismantling reducing to None and beneficial at the end of the Final Site Clearance phase after the Works Site is cleared.

Cumulative Assessment:
The consented cable factory would result in a **Medium** magnitude of change (for both the Preparations for Quiescence and Quiescence phases prior to decommissioning).
HNA Final Site Clearance would result in a **Very Low** magnitude of change reducing to Zero after dismantling.
The energy storage facility would be mostly screened by intervening vegetation resulting in a **Low** to **Very Low** magnitude of change where visible (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (Additional):
The additional effects from the Proposed Works would be **Minor**, beneficial to neutral and Not Significant (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (combined):
The combined cumulative effect would be **Moderate**, adverse and Not Significant (due to the cable factory and not the Proposed Works).

C26 Kilrusken Road

This minor road is routed from the B781, north of West Kilbride and connects with the A78 at Kilrusken Bridge at Viewpoint 5. The route does not pass through a Nationally or Locally designated landscape within the Study Area and is not designated as a tourist route. The value of the route is therefore assessed as **Medium**. The susceptibility to change from the introduction of the Proposed Works is considered to be **Low** and the overall sensitivity of this route is therefore assessed as *Medium*.

Most of the route is overlapped by the ZTV indicating theoretical visibility in oblique views for most of the route and views in the direction of travel as it approaches the A78. Views would be generally open along most of the route, with the exception of sections to the northern and southern ends of the route where views become intermittent and filtered due to roadside trees and rail embankments to the north. Where views are available, there would be oblique views of the Proposed Works affecting the reactor building which is visible above a line of trees as described in the assessment of Viewpoint 5 in **Appendix 14C**, **Table 14C.2**.

The effects for the 1.5 km of visibility within the study area are summarised in Viewpoint 5 as:
The Preparations for Quiescence phase would result in a **Minor**, beneficial to neutral and Not Significant level of effect;
The Quiescence phase would result in a **Minor**, beneficial to neutral and Not Significant level of effect; and
The Final Site Clearance phase would result in a **Moderate,** neutral to beneficial and Not Significant effect during dismantling reducing to **No View** and beneficial at the end of the Final Site Clearance phase after the Works Site is cleared.

Cumulative Assessment:
The cable factory would result in a **Medium** magnitude of change (for both the Preparations for Quiescence and Quiescence phases prior to decommissioning).
The energy storage facility would be mostly screened by intervening vegetation resulting in a **Very Low** magnitude of change where visible (for both the Preparations for Quiescence and Quiescence phases).
HNA Final Site Clearance would result in a **Very Low** magnitude of change reducing to Zero after dismantling.

Cumulative Effects (Additional):
The additional effects from the Proposed Works would be **Minor**, beneficial to neutral and Not Significant (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (combined):
The combined cumulative effect would be **Moderate**, adverse and Not Significant (due to the cable factory and not the Proposed Works).

Power Station Road / Oilrig Road

Power Station Road runs between the A78 at Hunterston Roundabout to a public car park at Hawking Craig. The eastern section of the road is closed to vehicular traffic and the parallel Oilrig Road is used to connect the road to the roundabout. Part of the route passes through the Works Area . Viewpoints 1 and 2 are located along this route. The route does not pass through a Nationally or Locally designated landscape however it forms part of the Ayr Coastal Path. The value of the route is therefore assessed as **High**. The susceptibility to change from the introduction of the Proposed Works is considered to be **High** due it its use by walkers who are more likely to be focused on landscape features. The overall sensitivity of this route is therefore assessed as *High*.

Most of the route is overlapped by the ZTV however theoretical visibility becomes patchy to the east of the route (Oilrig Road) as it approaches Hunterston Roundabout. Views of the Proposed Works from this section of the route (Oilrig Road) are generally screened by mature woodland. There would be clear views for ~1.4 km as the road passes close to the Proposed Works between the woodland at Hillhouse and the HNA Safestore after which views would become screened by landform and vegetation. Mitigation planting though the delivery of the ISLP (see **Appendix 14G**) would provide further screening / filtering of lower lying areas within the Works Area as it matures during the Quiescence and Final Site Clearance phases.

Views from this section of the route are described in the assessment of Viewpoint 1 and Viewpoint 2 in **Appendix 14C**, **Table 14C.2**.

The effects for the 1.4 km of visibility are summarised in Viewpoints 1 and 2 as:
The Preparations for Quiescence phase would result in a **Major to Major / Moderate,** adverse to neutral and beneficial and Significant level of effect reducing to **Moderate / Minor**, neutral to beneficial and Not Significant;
The Quiescence phase would result in a **Moderate / Minor**, beneficial to neutral and Not Significant level of effect; and
The Final Site Clearance phase would result in a **Major to Major / Moderate**, neutral and Significant level of effect reducing to Moderate / Minor and Not Significant to None, and beneficial at the end of the Final Site Clearance phase.

Cumulative Assessment:
The existing HNA would result in a **High** magnitude of change (Preparations for Quiescence phase). HNA Final Site Clearance would result in a **High** magnitude of change, reducing to **Very Low** to **Zero** (Quiescence phase). The consented cable factory would result in a **High** to **Medium** magnitude of change (for both the Preparations for Quiescence and Quiescence phases prior to decommissioning).
There may be glimpsed or heavily filtered winter views of the energy storage facility resulting in a **Very Low** to **Zero** magnitude of change (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (Additional)
Major to Major / Moderate, adverse to neutral and Significant reducing to **Moderate / Minor**, neutral to beneficial and Not Significant (Preparations for Quiescence phase).
Moderate / Minor, beneficial to neutral and Not Significant (Quiescence phase).

Cumulative Effects (combined):
The combined cumulative effect would therefore be **Major to Major / Moderate**, and Significant (due to the cable factory, HNA and Proposed Works) for both the Preparations for Quiescence phase and Quiescence phase. The effect would be adverse (cable factory) and neutral to beneficial (HNA and Proposed Works).

Fairlie Moor Road
(incorporating Core Paths NC33 and NC34)

Fairlie Moor Road is a minor road to the east of the Study Area which passes between Kaim Hill and the Crosbie Hills and connects the A78 at the former oil / coal terminal to Dalry beyond the Study Area to the east. The route traverses the Locally designated Mainland SLA and the Clyde Muirshiel Regional Park. It is also a Core Path. The value of the route is therefore assessed as **High**. The susceptibility to change from the introduction of the Proposed Works is considered to be **Medium** for road users in vehicles who would be focused on the road ahead and **High** for walkers whose focus would be on surrounding landscape features. The overall sensitivity of this route is therefore assessed as *High*.

ZTV coverage on the route is indicated for ~0.6 km as the road descends between Glenside Wood and Glenside Cottage. Views from this section would be intermittent through hedgerow gaps and gaps in middle distance tree belts, becoming increasingly oblique and screened as the route approaches Glenside Cottage. The reactor building would be visible as a noticeable but small and distant component in the intermittent views. The lower lying buildings would be mostly screened from views. Further glimpsed views of the upper parts of the reactor building are available near Knockendon Bridge for two 0.2 km sections of the route. The effects during the phases of the Proposed Works would be:
Preparations for Quiescence phase - The magnitude of change would be **Very Low** resulting in a **Moderate / Minor**, beneficial to neutral and Not Significant level of effect;
Quiescence phase – The magnitude of change would be **Very Low** resulting in a **Moderate / Minor**, beneficial to neutral and Not Significant level of effect; and
Final Site Clearance phase – The magnitude of change would be **Very Low** reducing to **Zero** resulting in a **Moderate / Minor**, neutral and Not Significant level of effect reducing to None and beneficial at the end of the Final Site Clearance phase.

Cumulative Assessment:
The existing HNA Would be mostly screened by the HNB reactor building from this route. The magnitude of change is **Very Low** (Preparations for Quiescence phase).
HNA Final Site Clearance – The HNA Safestores are partially screened by the HNB main reactor building in views. The magnitude of change would be **Very Low** to **Zero** (Quiescence phase).
Views of the consented cable factory would be partially screened by intervening landform and vegetation such that the tower is likely to be visible becoming increasingly prominent as the route approaches Glenside Cottage. The magnitude of change would range from **Low** to **High** (for both the Preparations for Quiescence and Quiescence phases prior to decommissioning).

Cumulative Effects (Additional):
The additional effects from the Proposed Works would be **Moderate / Minor**, beneficial to neutral and Not Significant (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (combined):
The combined cumulative level of effect would be **Major,** adverse and Significant (due to the cable factory and not the Proposed Works).

B896
(Incorporating Core Paths NC1, NC41)

The B896, is a circular route around Great Cumbrae Island. The route is located within the locally designated Great Cumbrae SLA. The value of the route is therefore assessed as **High**. Road users would be focused on the road ahead and the susceptibility to change from the introduction of the Proposed Works is considered to be **Medium**. The attention of recreational walkers accessing the Core Paths would be focused on the surrounding landscape features and susceptibility is considered to be **High**. The overall sensitivity of this route is assessed as *High*.

ZTV coverage is indicated on southern and south-eastern areas of the island between Clashfarland Point and Doughend Hole. Views along this section of the island are summarised in Viewpoint 6 in **Appendix 14C, Table 14C.2**. There would be oblique views of the Proposed Works for much of the route, with the exception of the route between Clashfarland Point and Farland Point where visibility would be in the direction of travel for southbound road users.

The effects of visibility are summarised in Viewpoint 6 as:
The Preparations for Quiescence phase would result in a **Moderate / Minor**, beneficial to neutral and Not Significant level of effect;
The Quiescence phase would result in a **Moderate / Minor**, beneficial to neutral and Not Significant level of effect; and
The Final Site Clearance phase would result in a **Moderate**, neutral and Not Significant effect reducing to None, and beneficial at the end of the Final Site Clearance phase.

Cumulative Assessment:
The existing HNA is a distant but visible focal point in views for walkers along the route – particularly NC41 and is assessed as having a **Low** magnitude.
HNA Final Site Clearance - would result in a **Low** magnitude during dismantling and deconstruction reducing to **Zero**.
The consented cable factory would result in a **Medium** magnitude of change.

Cumulative Effects (Additional):
The additional effects from the Proposed Works would be **Moderate / Minor**, beneficial to neutral and Not Significant (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (combined):
The combined cumulative effect would therefore be **Major / Moderate**, adverse and Significant (due to the cable factory and not the Proposed Works).

Ayrshire Coast Rail Line

The Ayrshire Coast Rail Line within the Study Area runs between West Kilbride and Fairlie following more elevated ground to the east of the A78 and C26 Kilrusken Road. It is located approximately 1.6 km east from the Proposed Works at its closest point near Viewpoint 5. The route does not pass through a Nationally or Locally designated landscape within the Study Area and is not designated as a tourist route. The value of the route is therefore assessed as **Medium**. Passengers on the train would be travelling at speed and would experience transient views depending on their location and orientation in the carriage. The susceptibility to change from the introduction of the Proposed Works is considered to be **Medium** and the overall sensitivity of this route is therefore assessed as *Medium*.

ZTV coverage is indicated between Drummilling Hill and North Kilrusken (~1.7 km). There are open views from parts of this section where the rail line is on embankment and there would be visibility of the upper parts of the reactor building. As the route travels north of Kilrusken, visibility becomes screened by woodland and surrounding built form as it approaches at Fairlie. Views of the Proposed Works would be screened by landform and tree belts, such that the reactor building would be the main visible element as described in the assessment of Viewpoint 5 in **Appendix 14C**, **Table 14C.2**. There would be no further theoretical visibility along the route within the Study Area. The level of effect for the ~1.7 km section of visibility would be similar to that described in Viewpoint 5:
The Preparations for Quiescence phase would result in a **Minor**, beneficial to neutral and Not Significant level of effect;
The Quiescence phase would result in a **Minor**, beneficial to neutral and Not Significant level of effect; and
The Final Site Clearance phase would result in a **Moderate / Minor**, neutral and Not Significant effect reducing to None and beneficial at the end of the Final Site Clearance phase.
Cumulative Assessment:
The existing HNA would have a **Very Low** magnitude during the Preparations for Quiescence phase.
HNA Final Site Clearance would have a **Very Low** magnitude (Quiescence phase).
The consented cable factory would result in a **Medium** magnitude of change (for both the Preparations for Quiescence and Quiescence phases prior to decommissioning).
The energy storage facility would be mostly screened by intervening vegetation resulting in a **Very Low** magnitude of change where visible from parts of the route (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (Additional):
The additional effects from the Proposed Works would be **Minor**, beneficial to neutral and Not Significant (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (combined):
The combined cumulative effect would therefore be **Moderate,** adverse and Not Significant (primarily due to the cable factory).

Visual effects on views from Recreational Routes

14F.1.10 The visual assessment has considered the potential visual effects likely to be experienced by people (walkers / cyclists / horse riders / joggers / others) on recreational routes within the Study Area. It includes local routes on the Core Path Network (rights of way and core paths) or regional long-distance routes and Sustrans cycle routes[1]. The assessment outcomes are reported in **Table 14F.3**, and the routes are shown in **Figure 14.4**.

14F.1.11 Each of these routes were walked and / or visited and walked in sections on 4 March and 23 March, 2022, according to the ZTV coverage and the assessment has been assisted with the use of sequential wirelines.

14F.1.12 All of the routes have been assessed as of *High* sensitivity on account of their **High** to **Medium** value as recreational routes, some routed through locally designated landscapes and the **High** susceptibility of the people using these routes, mostly walkers and cyclists, whose attention would be focused on the landscape around them.

14F.1.13 In summary, there would be significant visual effects from a ~1.4 km section of the Ayrshire Coastal Path as it passes close to the Proposed Works. Mitigation planting delivered thorugh the ISLP (see **Appendix 14G)** would provide further screening / filtering of lower lying areas within the Works Area as it matures during the Quiescence and Final Site Clearance phases. There would be no significant visual effects from other surrounding recreational routes from the Proposed Works due to distance and screening from vegetation and landform. Significant cumulative visual effects would occur as a result of the introduction of the consented cable factory in views from most of the Core Paths with the exception of NC111. Significant cumulative visual effects are also assessed at Ayrshire Coastal Path for the Final Site Clearance of HNA.

[1] Sustrans (n.d.). National Cycle Network. (online) Available at: https://www.sustrans.org.uk/national-cycle-network (Accessed November 2023).

Table 14F.3 Visual effects on views from Recreational Routes

Ayrshire Coastal Path
(incorporating Core Paths: NC60, NC61)

Within the Study Area, Ayrshire Coastal Path is routed along the coastline between West Kilbride in the south to Fairlie in the north. Part of the route passes through the Works Area. Viewpoints 1 and 2 are located along this route.

Assessment:
ZTV coverage occurs for ~ 2.4 km as the route passes along Power Station Road between HNA and Hunterston Roundabout. However, theoretical visibility becomes patchy as it approaches Hunterston Roundabout where views of the Proposed Works would be generally screened by mature woodland. There would be clear views for ~1.4 km as the route passes close to the Proposed Works between the woodland at Hillhouse and the HNA Safestore, after which views would become screened by landform and vegetation. Mitigation planting through the implementation of the ISLP **(see Appendix 14G**) would provide further screening / filtering of lower lying areas within the Works Area as it matures during the Quiescence and Final Site Clearance phases. Views from this section of the route are described in the assessment of Viewpoint 1 and Viewpoint 2 in **Appendix 14C, Table 14C.2**.

The effects for the 1.4 km of visibility are summarised in Viewpoints 1 and 2 as:
The Preparations for Quiescence phase would result in a **Major to Major / Moderate**, adverse to neutral and Significant level of effect reducing to **Moderate / Minor**, beneficial to neutral and Not Significant;
The Quiescence phase would result in a **Moderate / Minor**, beneficial to neutral and Not Significant level of effect; and
The Final Site Clearance phase would result in a **Major to Major / Moderate**, neutral to Beneficial and Significant level of effect reducing to **Moderate / Minor** and Not Significant to No View and beneficial at the end of the Final Site Clearance phase.

Cumulative Assessment:
The existing HNA (Preparations for Quiescence phase) would have a **High** magnitude.
HNA Final Site Clearance (Quiescence phase) would result in a **High-Medium** magnitude during dismantling and deconstruction works, reducing to **Very Low** to **Zero** thereafter.
The consented cable factory would result in a **High** magnitude (for both the Preparations for Quiescence and Quiescence phases prior to decommissioning).
There may be glimpsed or heavily filtered winter views of the energy storage facility resulting in a **Very Low** to **Zero** magnitude of change (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (Additional)
Major to Major / Moderate, adverse to neutral and Significant reducing to **Moderate / Minor**, beneficial to neutral and Not Significant (Preparations for Quiescence phase).
Moderate / Minor, beneficial to neutral and Not Significant (Quiescence phase).

Cumulative Effects (combined):
The combined cumulative effect would therefore be **Major** and Significant (due to HNA, the cable factory and the Proposed Works). The effect would be adverse (cable factory) and neutral to beneficial (HNA and Proposed Works).

Core Path NC36 - Hunterston Cycle Route

This route follows the access track to Hunterston Castle and connects the A78 with Power Station Road. Viewpoint 4 is located along this route. It is located approximately 0.5 km distance east from the Proposed Works at its closest point.

ZTV coverage is indicated at Millstonford Bridge for ~0.7 km of the route and again as the route travels north-east from Hunterston Castle. However, views along the route are mostly screened by landform, intervening tree belts and avenues of trees such that at most there would be glimpsed winter views of the top of the reactor building and associated works as assessed in Viewpoint 4 in **Appendix 14C, Table 14C.2**. Where the effects are assessed as:
The Preparations for Quiescence Phase would result in a **Moderate / Minor**, neutral and Not Significant level of effect;
The Quiescence Phase would result in a **Moderate / Minor**, neutral and Not Significant level of effect; and
The Final Site Clearance Phase would result in a **Moderate**, neutral and Not Significant effect reducing to None and beneficial at the end of the Final Site Clearance Phase.

Cumulative Assessment:
Extensive tree cover would screen visibility from much of the route however, the cable factory would be visible in close proximity at the northern end of the route and would result in a **High** magnitude (for both the Preparations for Quiescence and Quiescence phases prior to decommissioning).
There would be glimpsed and filtered views of the energy storage facility as the core path passes to the east of the development resulting in a **Low** magnitude of change (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (Additional):
The additional effects from the Proposed Works would be **Moderate / Minor**, neutral and Not Significant (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (combined):
The combined cumulative effect would therefore be **Major** and Significant (due to the cable factory and not the Proposed Works).

Core Path NC111 - Thirdpart

NC111 connects NC36 at the A78 with NC38 at Mhor.

The northern part of the route is overlapped by the ZTV, however, only the very top of the HNB reactor building would be visible. As a result the recladding of the Safestore and dismantling of the Safestore would be visible. The effects are assessed as:
Preparations for Quiescence phase - The magnitude of change would be **Very Low** resulting in a **Moderate / Minor**, neutral and Not Significant level of effect;
Quiescence phase - The magnitude of change would be **Very Low** resulting in a **Moderate / Minor**, neutral and Not Significant level of effect; and
Final Site Clearance phase - The magnitude of change would be **Very Low** reducing to **Zero** resulting in a **Moderate / Minor**, neutral and Not Significant level of effect reducing to None and beneficial at the end of the Final Site Clearance phase.

Cumulative Assessment:
The consented cable factory – Views would be partially screened by intervening landform and vegetation such that the top of the tower is likely to be visible. The magnitude of change would be **Medium** – **Low** (for both the Preparations for Quiescence and Quiescence phases prior to decommissioning).
There would be filtered views of the energy storage facility from the eastern section of the route as the core path passes to the east of the development resulting in a **Very Low** to **Zero** magnitude of change (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (Additional):
The additional effects from the Proposed Works would be **Moderate / Minor**, neutral and Not Significant (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects:
The combined cumulative effect would be **Moderate**, adverse and Not Significant (due to the cable factory and not the Proposed Works).

Core Path NC23 - Fairlie Moor Road

NC23 connects The Avenue at Drummilling Hill with Fairlie Moor Road via Kilrusken and Biglies Farm. The route passes within ~2 km of the Proposed Works at its closest point.

ZTV coverage is indicated for the majority of the route apart from a section to the north of Biglies Farm. Views would be mostly open along the route. The Safestore would be visible as a noticeable but small and distant component in the views with some visibility of lower lying buildings evident. The magnitude of change from the Proposed Works would be **Very Low** (during the Preparations for Quiescence phase and Quiescence phase) reducing to Zero at the end of the Final Site Clearance phase.
The effects are assessed as:
Preparations for Quiescence phase - The magnitude of change would be **Very Low** resulting in a **Moderate / Minor**, beneficial to neutral and Not Significant level of effect;
Quiescence phase - The magnitude of change would be **Very Low** resulting in a **Moderate / Minor**, beneficial to neutral and Not Significant level of effect; and
Final Site Clearance phase - The magnitude of change would be **Very Low** reducing to **Zero** resulting in a **Moderate / Minor**, neutral and Not Significant level of effect reducing to None and beneficial at the end of the Final Site Clearance phase.

Cumulative Assessment:
The existing HNA Safestores are partially screened by the HNB main reactor building in views (Preparations for Quiescence phase). The magnitude of change would be **Very Low**.
HNA Final Site Clearance – The HNA Safestores are partially screened by the HNB main reactor building in views. The magnitude of change would be **Very Low** to **Zero** during the Quiescence Phase of the Proposed Works.
The consented cable factory – There would be elevated views towards the horizontal spread of lower buildings and the tower. The magnitude of change would be **High-Medium** (for both the Preparations for Quiescence and Quiescence phases prior to decommissioning).

Cumulative Effects (Additional):
The additional effects from the Proposed Works would be **Moderate / Minor**, beneficial to neutral and Not Significant (for both the Preparations for Quiescence and Quiescence phases).

Cumulative Effects (combined):
The combined cumulative effect would therefore be **Major to Major / Moderate** and Significant (due to the cable factory and not the Proposed Works).

Core Path NC32 - Fairlie Burn to Diamond Hill
NC32 passes to the east of Glenside Wood and skirts the lower slopes of Black Hill terminating at Diamond Hill. It is located approximately 2.9 km north-east from the Proposed Works at its closest point. ZTV coverage is indicated to the north of Glenside Wood. Recladding of the reactor building to form the Safestore would be visible as a noticeable but small and distant component in the intermittent views. The lower lying buildings would be mostly screened from views. The effects during the phases of the Proposed Works would be: Preparations for Quiescence phase - The magnitude of change would be **Very Low** resulting in a **Moderate / Minor**, neutral and Not Significant level of effect; Quiescence phase - The magnitude of change would be **Very Low** resulting in a **Moderate / Minor**, neutral and Not Significant level of effect; and Final Site Clearance phase – The magnitude of change would be **Very Low** reducing to Zero resulting in a **Moderate / Minor**, neutral and Not Significant level of effect reducing to None and beneficial at the end of the Final Site Clearance phase. Cumulative Assessment: The existing HNA Safestores are partially screened by the HNB main reactor building in views. The magnitude of change would be **Very Low** during the Preparations for Quiescence phase. HNA Final Site Clearance – in the Quiescence phase, the magnitude of change would be **Very Low** to **Zero**. View of the consented cable factory would be partially filtered by intervening vegetation such that the tower and parts of the lower buildings are likely to be visible. The magnitude of change would be **High** (for both the Preparations for Quiescence and Quiescence phases prior to decommissioning). Cumulative Effects (Additional): The additional effects from the Proposed Works would be **Moderate / Minor**, neutral and Not Significant (for both the Preparations for Quiescence and Quiescence phases). Cumulative Effects (combined): The combined cumulative effect would therefore be **Major** and Significant (due to the cable factory only).
Core Path NC33 and NC34 - Fairlie Moor Road See assessment of Fairlie Moor Road in **Table 14F.2**.
Great Cumbrae (Core Paths NC1, NC41) See assessment of B896 in **Table 14F.2**.

Visual effects on views from Recreational and Tourist Destinations

14F.1.14 The visual assessment has considered the potential visual effects likely to be experienced by people at recreational / visitor or tourist destinations or attractions, which are overlapped by the ZTV and within the Study Area (see **Table 14F.4**). Each of these locations were visited as part of the site visits on the 4 and 23 March 2022.

14F.1.15 All of the destinations have been assessed as of *High* sensitivity on account of their **High** to **Medium** value as recreational and tourist destinations, some located within designated landscapes and the **High** susceptibility of the people visiting these destinations, whose attention would be focused on the landscape around them.

14F.1.16 In summary, there would be no significant effects as a result of the Proposed Works on Recreational and Tourist Destinations.

Table 14F.4 Visual effects on views from Recreational and Tourist Destinations

Receptor	Description of Effects
Hunterston Castle	Hunterston Castle is located ~0.5 km to the east of the Proposed Works and is accessible to visitors by appointment. The effects of the Proposed Works on Hunterston Castle are assessed in Viewpoint 4**, Appendix 14C, Table 14C.2**.
Millport	Millport is recognised as a tourist resort and includes sandy beaches, hotels, caravan parks, a golf course and features of interest such as the painted 'Crocodile Rock'. It is located on Great Cumbrae Island at approximately 4 km from the Proposed Works. The effects of the Proposed Works on Millport are assessed in Viewpoint 7, **Appendix 14C, Table 14C.2**, and above in **Table 14F.1**.

Appendix 14G: Hunterson B Interim State Landscape Plan

Technical Note

Hunterston B: Interim State Landscape Plan

1. Introduction

1.1 Background

1.1.1 WSP has been commissioned by EDF to develop an indicative Interim State Landscape Plan (ISLP) in support of the Hunterston B (HNB) decommissioning process.

1.1.2 The ISLP is provided for assessment purposes, in response to a request in the Office of Nuclear Regulation (ONR) Pre-Application Opinion, which states that "*The EIA should consider a landscape and habit enhancement strategy, including proposals for landscape and ecology migration and monitoring arrangements*".

1.1.3 The ISLP is also a proposed embedded measure to mitigate the visual impacts experienced from the North Ayrshire Coastal Path, during the Quiescence and Final Site Clearance phases of decommissioning. The visual impacts are further discussed in **Chapter 14: Landscape and Visual Impact Assessment (LVIA)** of the Environmental Statement.

1.2 Purpose and structure of this document

1.2.1 This ISLP sets out the long-term landscape management objectives for the HNB Works Area. It should be read in conjunction with the indicative Interim State Landscape Plan (Drawing 852351-WSPE-XX-XX-FG-OL-00020_S2_P01.4). Together these documents provide a framework for how detailed landscape management prescriptions would be delivered, so that the landscape design intentions can be achieved.

1.2.2 The ISLP is structured as follows:

- Section 2 – Summary of landscape context and general design objectives. This section also provides a summary of the principal constraints and considerations to be taken into account within the Works Area.
- Section 3 – Landscape proposals. This section details the objectives and mitigation measures that will be implemented within the Works Area relating to the soft landscape.
- Appendix A – Planting schedule and specification/guidance on planting. This sets out the planting specification and methodology.
- Appendix B – Management requirements and maintenance. This contains the standard annual implementation and maintenance timetable for the specified planting.

2. Landscape context and design objectives

2.1 Landscape context

2.1.1 The Works Area is located within the Raised Beach Coast and Cliffs Landscape Character Type (LCT). This is described as '"*Raised beach, visible as a level shelf backed by a steep, sometimes craggy escarpment representing the former cliff line, above which lies more gently rising land*."[1] Vegetation within the LCT is characterised by "*dense, often wind sheared broadleaf woodland*"[1] along parts of the former cliff line.

2.1.2 Two discrete landforms are present to the immediate south of the Works Area; Goldenberry Hill, which rises to an elevation of 140 m Above Ordinance Datum (AOD) and the smaller Campbelton Hill to its east, which reaches an elevation of 76 m AOD. These landforms are partially wooded and screen much of the Works Area in views from the south and east. The coastal foreshore to the immediate north of the Site is low-lying with extensive tidal mudflats at Hunterston and Southannan Sands. This low-lying coastal fringe continues to the north-east of the Site.

2.1.3 The Site itself is located on a gentle, north facing slope which rises from an elevation of approximately 5 m AOD close to the northern boundary of the Site to approximately 25 m AOD at its southern boundary. The area within the Site predominantly features built form of the reactor building and adjoining turbine hall, and an expansive range of smaller ancillary buildings, warehouses and tanks. These are set within operational land-uses comprising access roads and service yards all bound by security fencing. The remaining areas within the Works Area comprise staff car parks located within the north-western corner of the Site, amenity grassland with some tree cover along the southern edge of the reactor building and the southern perimeter of the Site.

2.1.4 The Site is accessed from the northwest by Power Station Road which follows the coastline from Hunterston Roundabout on the A78. The Ayrshire Coastal Path follows Power Station Road and continues south, passing through the Works Area as it continues along the coastline towards Portencross and West Kilbride.

2.2 General design objectives

2.2.1 The following objectives set out an indicative framework for the future improvement and mitigation of the Works Area.

Mitigate visual effects

Objectives:

- Mitigate visual effects during the Quiescence and Final Site Clearance phases; and
- Maximise screening for receptors accessing the Ayrshire Coastal Path and Power Station Road.

[1] NatureScot (2019). Scottish Landscape Character Types Map and Descriptions. (online). Available at: https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions (Accessed 12 September 2023).

Soften the built environment

Objectives:

- Reduce the perceived 'harshness' of built elements through the introduction of soft landscape elements (shrubs and trees).

Integrate into the surrounding landscape character

Objectives:

- Minimise the effect of the Proposed Works on the surrounding landscape;
- Protect and enhance tree and hedgerow cover within the Works Area;
- Positively contribute towards the existing landscape features and vegetation pattern in the surrounding area; and
- Enhance local biodiversity and the ecological value of the Works Area.

2.3 Constraints

2.3.1 Areas of existing hard landscaping including road surfaces, concrete foundations and areas of hardstanding are to be retained during the decommissioning process as it is anticipated the 'end state' for the site will be as Brownfield development. Therefore, proposed planting has been restricted to those areas where there is existing soft landscaping within the Works Area.

3. Landscape proposals

3.1 Introduction

3.1.1 The proposed landscape elements included to meet the design objectives are detailed in this section. The management prescriptions and measures provided below assume implementation of a design similar to that illustrated in the Hunterston B: Indicative Interim State Landscape Plan drawing 852351-WSPE-XX-XX-FG-OL-00020_S2_P01.4.

3.2 Mixed deciduous and evergreen shrubs

Design objectives

3.2.1 Mixed deciduous and evergreen shrubs have been designed to introduce a dense mix of native vegetation in constricted, linear areas of ground where there is not enough physical capacity to provide dense tree cover.

3.2.2 One of the objectives of the shrubs is to provide screening of parts of the ground and lower lying Works Area for people accessing the Ayrshire Coastal Path and Power Station Road – particularly as they approach from the north-east. For this reason, the shrubs are located to the eastern and north-eastern edges of the Works Area. Given the height of the existing reactor/Safestore building, it is not realistic for vegetation to screen this element

of the Proposed Works, but this provides the benefit of screening concrete bases of former buildings and on-site voids retained through the Quiescence phase.

3.2.3 In addition to screening, the shrubs will also help to soften the built environment, provide ecological benefits though habitat connectivity and generally contribute towards the green infrastructure within the Works Area. The planting also provides the opportunity to positively contribute to the surrounding landscape features and local landscape character.

3.3 Mixed deciduous and evergreen trees

Design objectives

3.3.1 Mixed deciduous and evergreen trees have been designed to introduce a dense mix of native vegetation within larger areas of ground within the Works Area. These are mostly located in areas of existing poor semi-improved grassland.

3.3.2 One of the objectives of the trees is to provide screening of the Works Area for people accessing the Ayrshire Coastal Path and Power Station Road, particularly as they pass close to the main entrance and parking area of HNB. For this reason, the majority of the trees are located at the eastern edge of the Works Area, and include an area to the north within the Works Area. The trees would tie in with existing trees towards the centre of the Works Area and woodland to the south and south-east of the Works Area to form a cohesive pattern of tree cover.

3.3.3 In addition to screening, the trees will also help to soften the built environment, provide ecological benefits and generally contribute towards the green infrastructure within the Works Area. The planting also provides the opportunity to positively contribute to the surrounding landscape features and local landscape character.

4. Appendix A

4.1 Planting schedule

The planting schedule is presented in the Hunterston B: Indicative Interim State Landscape Plan (852351-WSPE-XX-XX-FG-OL-00020_S2_P01.4) and reproduced here.

Table 1 Planting Schedule

Number	Abbreviation	Species	Common Name	Specification	Density / spacing	Percentage Contribution
Screening shrub mix						
1169	Agl	Alnus glutinosa	Common alder	2 yr: Container grown: C3: Full pot	3/m²	20%
1460877		Ilex aquifolium	Holly	2 yr: Container grown: C3: Full pot	3/m²	25%
23362918	LIGVU	Ligustrum vulgare	Common Privet	2 yr: Container grown: C3: Full pot	3/m²	40%
877	PRUSP	Prunus spinosa	Blackthorn	2 yr: Container grown: C3: Full pot	3/m²	15%
Total: 58425841						
Tree mix						
255	Ac	Acer campestre	Field maple	Hvy std: 2X: Clear stem 175-200cm: BR: 5 brks	2Ctr	10%
378	BETPU	Betula pubescens	Downy birch	Hvy std: 2X: Clear stem 175-200cm: BR: 5 brks	2Ctr	15%

Number	Abbreviation	Species	Common Name	Specification	Density / spacing	Percentage Contribution
378	Cmo	Crataegus monogyna	Common hawthorn	Fthr: 2X: BR: 5 brks	2Ctr	15%
255	FASY	Fagus sylvatica	Common beech	Hvy std: 2X: Clear stem 175-200cm: BR: 5 brks	2Ctr	10%
129	PINNIA	Pinus nigra var. austriaca		Container grown: 2X: C45	2Ctr	5%
129	PINSY	Pinus sylvestris	Scots pine	Container grown: 2X: C45	2Ctr	5%
378	Ppa	Prunus padus	Bird cherry	Fthr: 2X: BR: 5 brks	2Ctr	15%
255	Qr	Quercus robur	Common oak	Hvy std: 2X: Clear stem 175-200cm: BR: 5 brks	2Ctr	10%
378	Sau	Sorbus aucuparia	Mountain ash	Fthr: 2X: BR: 5 brks	2Ctr	15%
Total: 2535						

4.2 Specification and guidance on planting

General guidance

Timing

4.2.1 Ground preparation would be required in advance of all planting and seeding. No soil handling to be undertaken when the soil is wet to the extent that loss of structure would occur.

4.2.2 Planting of bare root stock to be carried out in the first available planting season (between October and March inclusive), as dictated by the decommissioning programme.

4.2.3 Containerised stock to be planted during suitable weather conditions (avoiding periods of drought or extreme inclement weather).

Soils

4.2.4 All soil handling and storage to be undertaken in accordance with the following British Standard Specifications and Code of practice:

- BS 1377: 1990 Soils for Civil Engineering Purposes
- BS 8601: 2013 Specification for Subsoil and Requirements for Use
- BS 3882: 2015 Specification for Topsoil

4.2.5 Subsoil to be de-compacted in advance of earthworks as required.

4.2.6 Replacement of topsoil must be carried out in appropriate dry weather conditions. Spread evenly in layers not exceeding 150 mm thick. Finished depth (following firming) to be informed by intended vegetation cover, as follows:

- Shrub beds/hedges: 200-300 mm;
- Standard tree planting (1.5 m radius of the main stem): 300 mm maximum.

4.2.7 After spreading, topsoil to be cultivated to a condition suitable for blade grading. Large and unwanted material (75 mm and over) to be picked off and removed. (Screening in advance of spreading is recommended.) Areas to be passed with a light roller to firm surface without compaction.

Cultivation of shrub beds and tree pits

4.2.8 When shrub beds and tree pits occur in large grass areas, formation levels should be prepared at the specified depth for grass over the whole area. Further excavation should be subsequently carried out to the additional depth for shrub and tree planting.

4.2.9 In all cases, the soil profile is to be maintained when replacing.

Softworks

4.2.10 All plant stock, plant handling and planting to be undertaken in accordance with the following British Standard Specifications and Code of Practice:

- BS 3936: 1992 Part 1 Nursery Stock - Specification for Trees and Shrubs;
- BS 4428: 1989 - Code of Practice for General Landscaping Operations (excluding hard surfaces);
- BS 8545: 2014 Trees from nursery to independence in the landscape; and
- The Code of Practice for Plant Handling 2002 (Horticultural Trades Association).

4.2.11 All planted stock must carry the relevant plant passport or Phytosanitary Certificate as required by the latest industry regulations including Regulation (EC) No. 2016/2031.

4.2.12 All planted stock will be required to be supplied in accordance with the size and description specified in a Plant Schedule. All planting undertaken for use as part of the ISLP are required to be healthy, vigorous, free from pests and diseases, suitably hardened off for the proposed situation of planting, and lifted at a time in accordance with good nursery practice. Stock shall have a well-formed fibrous root system and be free from perennial weeds. Bulbs to be true to name, free of pests and diseases, and of the correct approved size for the species. Native species must be British provenance.

Standard trees - soft landscapes

4.2.13 Pits to be excavated to twice the diameter of the root system, container, or root ball, deep enough to accommodate the full root system to the base of the main stem following settlement. Trees must not be planted too deep.

4.2.14 Backfill with 250 mm depth inert aggregate e.g. washed pea shingle.

4.2.15 Sides of pit to be scarified by 200 mm. Base to be punctured without breaking up soil.

4.2.16 Tree to be centrally located and stem placed in an upright position. Back-fill with excavated material, maintaining the original soil profile.

4.2.17 Trees within amenity grass areas to be cleared of turf to a radius of 500 mm from the main stem. Soil volume to finish 100mm below surrounding grass to allow for mulch (see below).

4.2.18 Trees up to 12-14 cm girth to be supported with single 75 mm dia. stake to the prevailing windward side and anchored with a single super soft adjustable tree tie. Stakes to be driven in to be fully stable, and sawn down to leave 500 mm above soil level. Fix adjustable tree ties to the top 75mm of the stake.

4.2.19 Trees between 14 cm and 20 cm girth to be supported with two 75 mm dia. stakes, positioned on opposite sides of the main stem, driven in to be stable, and sawn down to leave 750 mm above soil level. Fix adjustable tree ties to the top 75 mm of each stake.

4.2.20 All trees to be watered to field capacity on day of planting.

Planting Beds

4.2.21 Planting to be undertaken in appropriate weather conditions, avoiding prolonged periods of drought, and preferably preceding predicted precipitation.

4.2.22 Pits for containerised shrubs to be excavated to at least one third larger than the root system. Backfill material to incorporate 30% organic matter and slow release fertiliser at 3 g/m2/.

4.2.23 Bare root plants to be dipped in rooting hormone prior to planting.

4.2.24 40-60cm stock to be notch planted at specified density using 'T' or 'L' notches, or pit planted if the root system is larger.

4.2.25 Bare root stock over 60 cm high to be pit planted as per containerised stock.

4.2.26 All plants to be firmed upright, ensuring root flare sits at soil level.

Protection of native stock

4.2.27 All planted native shrubs and hedging stock to be protected with 60 cm biodegradable spiral guards or mesh tree shelters.

4.2.28 Standard stock that is considered free of risk of predation must be fitted with a suitable strimmer guard to base to prevent maintenance damage.

Mulching

4.2.29 All planted beds to receive mulch within five days of planting operations.

4.2.30 Mulch to be locally sourced where possible, to be medium grade, organic, free from fines, weeds, disease and contaminants.

4.2.31 Trees planted within grass are to be mulched to a 500 mm radius from the main stem to a settled depth of 100 mm.

4.2.32 Planted beds to be spread with bark mulch to a settled depth of 100 mm.

4.2.33 Hedge lines to be spread with bark mulch to a depth of 100 mm, reaching 500 mm either side of the centre line. Mulch mats may be used if preferred.

5. Appendix B

5.1 Management responsibilities

5.1.1 The maintenance and any necessary replacement of any soft landscape elements will be covered initially under the 12 months Defects Liability Period for the works contract. Within this period, the maintenance of the soft landscape will be undertaken by the employed landscape contractor, after which responsibility will be passed to a management company.

5.2 Management requirements

5.2.1 Guidance for planting is outlined in the Hunterston B: Indicative Interim State Landscape Plan (852351-WSPE-XX-XX-FG-OL-00020_S2_P01.4). Ongoing maintenance and management requirements are outlined below and in **Table 2**.

Mixed deciduous and evergreen shrubs

5.2.2 During and following the establishment of the planting ensure that sufficient water is applied to maintain healthy growth as required. Ensure that full depth of topsoil is saturated. Watering programme should be monitored to ensure that at times of water shortage (e.g., drought) sufficient water is applied to meet the conditions.

5.2.3 Keep all beds clear of weeds by cultivating and use of approved herbicides. Fork-over/hoe beds as necessary to keep soil loose, disposing of arisings off-site.

5.2.4 Apply an annual single dose of evenly spread, 11:22:9 NPK slow-release fertilizer at a rate of 60 g per m2, in March-April.

5.2.5 Mulch the surface of the planting beds with chipped tree bark following planting, to a depth of 75 mm. Regularly monitor mulch levels and re-mulch in July to original depth, or when required.

5.2.6 Regularly check for plantings which have been loosened by wind or frost and re-firm any loose plants back into the ground.

5.2.7 Monitor and replace failed planting with new equivalent plants between October and March. All plants should be maintained in a disease and pest free state through the application of a suitable proprietary herbicide/pesticide.

5.2.8 Tree support systems (tree stakes and ties) shall be checked, adjusted and replaced as necessary during the establishment period. Redundant tree support systems should be removed once trees are fully established (generally in year 5).

5.2.9 Any dead or severely damaged trees shall be replaced in the next available planting season (generally October to March inclusive). Replacement planting is to be in accordance with the original specification or as otherwise agreed with the contract administrator.

Table 2 Maintenance and management requirements

Activity	Year 1	Year 2	Year 3	Year 4	Year 5
Tidy up and remove rubbish and litter from all planting areas	Each visit	Each visit	Each visit	Each visit	Each visit
Check and re-firm protective shelters and ties	Each visit	Each visit	Each visit	Each visit	Each visit
Weed control – control weed growth through appropriate herbicide usage and maintaining mulch where appropriate	April-Sept as required.	April-Sept as required.	April-Sept as required.	April-Sept as required.	April-Sept as required.
Undertake formative/remedial pruning to encourage growth and promote good form	Annually, as required Sept-Jan	Annually, as required Sept-Jan	Annually, as required Sept-Jan	Annually, as required Sept-Jan	Annually, as required Sept-Jan
Remove any dead plant material at the end of the growing season	Annually, as required Sept-Oct	Annually, as required Sept-Oct	Annually, as required Sept-Oct	Annually, as required Sept-Oct	Annually, as required Sept-Oct
Supply and apply slow release fertiliser to base of individual trees; 50g/per tree	Annually Mar-April	Annually Mar-April	Annually Mar-April	Annually Mar-April	Annually Mar-April

Planting Schedule

Screening shrub mix

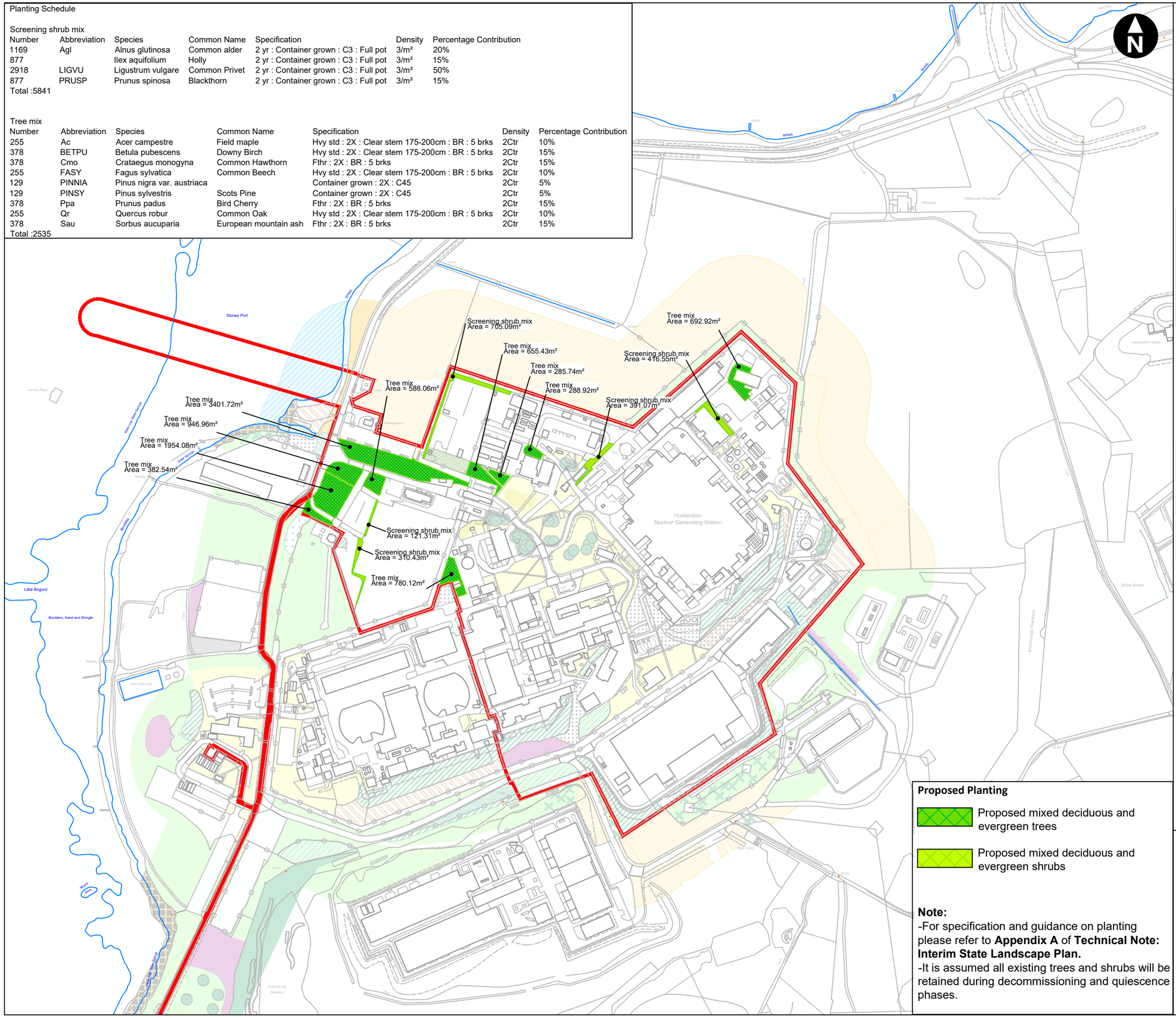
Number	Abbreviation	Species	Common Name	Specification	Density	Percentage Contribution
1169	Agl	Alnus glutinosa	Common alder	2 yr : Container grown : C3 : Full pot	3/m²	20%
877		Ilex aquifolium	Holly	2 yr : Container grown : C3 : Full pot	3/m²	15%
2918	LIGVU	Ligustrum vulgare	Common Privet	2 yr : Container grown : C3 : Full pot	3/m²	50%
877	PRUSP	Prunus spinosa	Blackthorn	2 yr : Container grown : C3 : Full pot	3/m²	15%

Total :5841

Tree mix

Number	Abbreviation	Species	Common Name	Specification	Density	Percentage Contribution
255	Ac	Acer campestre	Field maple	Hvy std : 2X : Clear stem 175-200cm : BR : 5 brks	2Ctr	10%
378	BETPU	Betula pubescens	Downy Birch	Hvy std : 2X : Clear stem 175-200cm : BR : 5 brks	2Ctr	15%
378	Cmo	Crataegus monogyna	Common Hawthorn	Fthr : 2X : BR : 5 brks	2Ctr	15%
255	FASY	Fagus sylvatica	Common Beech	Hvy std : 2X : Clear stem 175-200cm : BR : 5 brks	2Ctr	10%
129	PINNIA	Pinus nigra var. austriaca		Container grown : 2X : C45	2Ctr	5%
129	PINSY	Pinus sylvestris	Scots Pine	Container grown : 2X : C45	2Ctr	5%
378	Ppa	Prunus padus	Bird Cherry	Fthr : 2X : BR : 5 brks	2Ctr	15%
255	Qr	Quercus robur	Common Oak	Hvy std : 2X : Clear stem 175-200cm : BR : 5 brks	2Ctr	10%
378	Sau	Sorbus aucuparia	European mountain ash	Fthr : 2X : BR : 5 brks	2Ctr	15%

Total :2535



Proposed Planting

- Proposed mixed deciduous and evergreen trees
- Proposed mixed deciduous and evergreen shrubs

Note:
-For specification and guidance on planting please refer to **Appendix A** of **Technical Note: Interim State Landscape Plan.**
-It is assumed all existing trees and shrubs will be retained during decommissioning and quiescence phases.

Key

- Nuclear Site Licence Boundary ("The Site")
- Indicative Dismantling Works Area ("Works Area")

Existing Landscape Features

- Broadleaved woodland - plantation
- Broadleaved woodland - semi-natural
- Mixed woodland - plantation
- Poor semi-improved grassland
- Neutral grassland - semi-improved
- Improved grassland
- Amenity grassland
- Tall ruderal
- Introduced shrub
- Dune scrub
- Ephemeral short perennial
- Marsh/marshy grassland
- Shingle/gravel above high tide mark
- Rocks/boulders above high tide mark
- Scrub - dense/continuous
- Scrub - scattered
- Running water - brackish
- Parkland and scattered trees - broadleaved
- Parkland and scattered trees - coniferous
- Fence

0 m 250 m

Scale 1:5,000 @ A3

Decommissioning of Hunterston B Nuclear Power Station

Hunterston B: Indicative Interim State Landscape Plan

October 2023

15.

Noise and Vibration

Appendix 15A: Noise Survey Report

EDF Energy Nuclear Generation Ltd

Decommissioning Hunterston B

Noise Survey Report

This report was prepared by WSP Environment & Infrastructure Solutions UK Limited (formerly known as Wood Environment & Infrastructure Solutions UK Limited), company registration number 02190074, which is carrying out these services as a subcontractor and/or agent to Wood Group UK Limited

December 2022

Report for

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Document revisions

No.	Details	Date
1	First Issue	June 2022
2	Final Issue	December 2022

Executive summary

Purpose of this report

EDF Energy (the Applicant) is developing proposals to decommission Hunterston B Nuclear Power Station, ('the Proposed Works'). WSP Environment and Infrastructure Solutions UK Ltd (hereafter referred to as WSP) has been contracted by the Applicant to complete the baseline data collection to inform the Environmental Impact Assessment (EIA) for the Proposed Works.

This report presents details of the noise survey that have been undertaken to inform the EIA for the Proposed Works. The baseline sound level surveys were conducted between Wednesday 27 April 2022 and Wednesday 4 May 2022.

The purpose of the surveys was to determine robust and accurate baseline data to inform the noise assessments for the EIA to be presented in the Environmental Statement (ES).

Baseline monitoring

All monitoring, and subsequent data processing, analysis and reporting was undertaken in accordance with the relevant British Standards and the methodology agreed with North Ayrshire Council (NAC). Details of the monitoring are provided in **Section 2**. Monitoring results are presented in **Section 3** and analysis of the results is provided in **Section 4**. Based on the measured sound pressure levels, and analysis thereof, the representative sound levels to be used in the assessments are presented in **Section 4.3**.

Contents

1. Introduction

1.1 Purpose of this report

1.1.1 EDF Energy (the Applicant) is developing proposals to decommission Hunterston B Nuclear Power Station, ('the Proposed Works'). WSP Environment and Infrastructure Solutions UK Ltd (hereafter referred to as WSP) has been contracted by the Applicant to complete the baseline data collection to inform the EIA for the Proposed Works.

1.1.2 This report presents details of the noise survey that have been undertaken to inform the EIA for the Proposed Works. The baseline sound level surveys were conducted between Wednesday 27 April 2022 and Wednesday 4 May 2022.

1.2 Site context

1.2.1 The Hunterston B Nuclear Power Station ('the Site') is situated approximately 3.3 km to the north-west of West Kilbride, immediately south of the Southannan Sands Site of Special and Scientific Interest (SSSI), designated for the presence of biological features including intertidal marine habitats, saline lagoons and sandflats[1], on the eastern side of the Firth of Clyde. The centre of the Site is at approximate National Grid Reference (NGR) NS 184 514.

1.2.2 The majority of the Site is occupied by built structures and hard standing (mainly access roads and car parks). The Site is bounded by rough pasture to the north, east and south, with the decommissioned Hunterston A to the south-west.

[1] Friends of the Firth of Clyde (n.d.). Southannan Sands Site of Special and Scientific Interest. (Online). Accessible at: https://friendsoffirthofclyde.org/southannan_sssi/

2. Methodology

2.1 Overview

2.1.1 The survey methodology (see **Section 2.2**) and noise monitoring locations were agreed with the Environmental Health Officer (EHO) from North Ayrshire Council (NAC) via email communications and virtual meetings in Spring 2022.

2.1.2 As part of this engagement, it was agreed that long-term monitoring would be undertaken for a duration of at least five days, to include a weekend, and that short-term monitoring would consist of six sample measurements at each location, with three one hour samples during the daytime (07:00 to 23:00 hrs) and three 15 -minute samples during the night-time (23:00 to 07:00 hrs). The agreed monitoring locations are detailed in **Table 2.1** and shown on **Figure 2.1** in **Appendix A** (hereafter **figure 2.1**).

2.1.3 The survey methodology was designed to accord with the requirements of BS 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*'[2] and BS 5228-1:2009+A1:2014 *'Noise and vibration on construction and open sites. Part 1: Noise*'[3].

Identification of receptor locations

2.1.4 Noise monitoring locations were selected to be representative of Noise Sensitive Receptors (NSRs) within a defined Study Area (defined as 2 km from the Site) that exhibit the greatest potential to be affected by noise from the Proposed Works. The NSRs and noise monitoring locations were identified through review of aerial imagery and mapping data. The monitoring locations, key NSR locations and Study Area are identified in **Figure 2.1**.

2.2 Details of the monitoring undertaken

Data collection methods

Sound level data

2.2.1 For the Long-Term monitoring locations (defined hereafter as LT), monitoring equipment was left unattended to measure sound levels continuously for approximately seven days. Observations of the sound environment were made during equipment deployment and collection to contextualise the monitoring location. The measurements were undertaken during local schools' term-time; however, it should be noted that the monitoring period was inclusive of a Bank Holiday on Monday 2 May 2022.

2.2.2 At the Short-Term monitoring locations (hereafter referred to as ST), measurements were attended and consisted of three one-hour samples during the daytime and three 15-minute samples during the night-time, with observations noted throughout. Where any unrepresentative, extraneous events occurred (such as local activity, people talking near

[2] British Standards Institution. British Standard BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. London, BSI.
[3] British Standards Institution (BSI, 2014) *British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*. London, BSI.

the measurement position, noise from aircraft passing overhead, etc.), these were excluded from the measurements.

2.2.3 All monitoring locations are described in **Table 2.1**, and details about the monitoring positions, photographs of the measurement locations and observations made during deployment and collection of the long-term measurements and throughout the short-term measurements are detailed in **Appendix B**.

2.2.4 Short-term measurements consisted of 1-hour samples during the daytime and 15-minute samples during the night-time. The long-term monitoring equipment was set to measure for intervals of 15-minutes in accordance with BS 4142:2014+A1:2019[2], which states:

2.2.5 *"8.1.3 Ensure that the measurement time interval is sufficient to obtain a representative value of the background sound level for the period of interest. This should comprise continuous measurements of normally not less than 15 min intervals, which can be continuous or disaggregated."*

2.2.6 All sound level measurements were undertaken in accordance with BS 4142:2014+A1:2019[2] and BS 7445-1:2003 '*Description and measurement of environmental noise. Part 1: Basic quantities and procedures*[4]', with microphones mounted to a minimum height of 1.2 m to 1.5 m above ground level and no less than 3.5 m from any reflecting surface other than the ground.

2.2.7 At each LT and ST monitoring location (see **Figure 2.1**), sound levels were measured using integrating averaging sound level meters (SLMs), conforming to Class 1 as defined by BS EN 61672-1:2013 *'Electroacoustics, Sound level meters, Specifications'*[5]. All SLMs were subject to laboratory calibration within a period not exceeding two years prior to deployment, with certification provided in **Appendix C**. The SLMs were subsequently field calibrated prior to and after each survey period by applying an acoustic calibrator (conforming to BS EN 60942:2018 '*Electroacoustics – Sound calibrators*'[6]), to the microphone to check the sensitivity of the monitoring equipment. Any drift in calibration levels was noted at the end of the survey period; no significant deviation was found. All acoustic calibrators were subject to laboratory calibration within a period not exceeding one year prior to use (see **Appendix C** for certification).

Meteorological data

2.2.8 A Meteorological station was deployed to monitor local wind speeds, wind direction and precipitation during the survey period. The meteorological station was collocated with the monitoring equipment at LT3 (see **Figure 2.1**). The logged meteorological data has been used in the analysis of the sound level data to ensure that only data collected during appropriate weather conditions (i.e. not adversely affected by precipitation or wind speeds in excess of 5 m/s) have been used when determining representative sound levels to be used in the assessment.

Data collection locations

2.2.9 Descriptions of the monitoring locations and periods when monitoring was undertaken are set out in **Table 2.1** and shown in **Figure 2.1**. Further details are provided in **Appendix B**.

[4] International Standards Organisation, 1991. ISO 1996:1982 (BS 7445:1991) Description and measurement of environmental noise. BSI, London.
[5] British Standards Institution. British Standard EN 61672-1:2013. Electroacoustics - Sound level meters, specifications.
[6] British Standards Institution. BS EN 60942:2018 Electroacoustics – Sound calibrators. London, BSI.

Table 2.1 Summary of monitoring locations

Location Reference	Location description	Location Co-ordinates		Monitoring period
		Latitude	Longitude	
LT1	Front lawn of property, in a residential area. Approximately 50 m north of the coast/ high water mark. Approximately 10 m north of the carriageway edge of Marine Parade, Greater Cumbrae.	55° 44' 56.3" N	4° 54' 51.1" W	27/04/2022 – 04/05/2022
LT2	On grass next to car park, next to Farm, 40 m from A78 Irvine Road, cottages nearby, mostly farmland, road and trees between NSR and source, soft ground mostly.	55° 44' 13.7" N	4° 51' 37.0" W	27/04/2022 – 04/05/2022
LT3	Located in Hunterston Castle grounds, approximately 10 m north of cottages, wide open field/lawn.	54° 43' 23" N	4° 52' 43.0" W	27/04/2022 – 04/05/2022
LT4	Located on lawn south of cottage on A78 Irvine Road.	55° 41' 47" N	4° 52' 05.0" W	27/04/2022 – 04/05/2022
ST1	Located on Fairlie Viewpoint, adjacent to the car park. Approximately 20 m from the coast/ high water mark.	55° 45′ 05″ N	4° 51′ 30″ W	27/04/2022 - 28/04/2022
ST2	Located on Montgomerie Avenue, approximately 10 m east from the A78 Irvine Road. Approximately 25 m east from the coast at high tide.	55° 44′ 55″ N	4° 51′ 24″ W	27/04/2022 - 28/04/2022
ST3	Located approximately 10 m west from Freepart Farm properties. Surrounded by agricultural land.	55° 42′ 32″ N	4° 53′ 10″ W	27/04/2022 - 28/04/2022
ST4	Located 10 m north of property on Portencross Road and adjacent west of the Ayrshire Coastal Path. Approximately 15 m east from B7048 Portencross Road. Approximately 25 m east of coast.	55° 42′ 01″ N	4° 54′ 15″ W	27/04/2022 - 28/04/2022

3. Results

3.1 Meteorological conditions

3.1.1 With reference to the weather data presented in the time history charts in **Section 3.2**, meteorological conditions were generally stable and calm throughout the long-term surveys, with some periods of precipitation and average wind speeds of up to 3 m/s. Some data has been excluded from the analysis during precipitation events, and after precipitation events, where the measured noise levels appear to have been influenced by increased noise from road traffic movements on wet road surfaces. During two night-time short-term measurements, wind speeds of between 5 to 6 m/s were recorded, and these two samples were excluded from the analysis, as the measured sound levels were confounded by gusts of wind. All exclusions are discussed in **Section 4**.

3.1.2 The wind direction statistics in **Table 3.1**, based on analysis of the logged meteorological data, indicate that the wind direction over the monitoring period is consistent with the prevailing wind direction, with winds from the west, southwest and south for around 40% of the monitoring period.

Table 3.1 Wind direction as a percentage of time over the monitoring period

Wind Direction	N	NW	W	SW	S	SE	E	NE	No direction recorded (wind speed too low)
% of monitoring period	2.1	9.0	9.1	17.2	11.9	15.5	18.8	3.9	12.7

3.2 Long-term measurements

3.2.1 Long Term measurements were undertaken at four locations, as set out in **Table 2.1**, with the results provided in the following sub-sections.

LT1

3.2.2 The time history chart indicating the measured sound levels over the whole monitoring period at LT1 is presented in **Figure 3.1**. Summaries of the results for weekdays and the weekend are presented in **Table 3.2**, **Table 3.3** and **Table 3.4**. Distribution charts are shown in **Figure 3.2** and **Figure 3.3**.

Figure 3.1 Results of long-term monitoring: LT1 – Time history

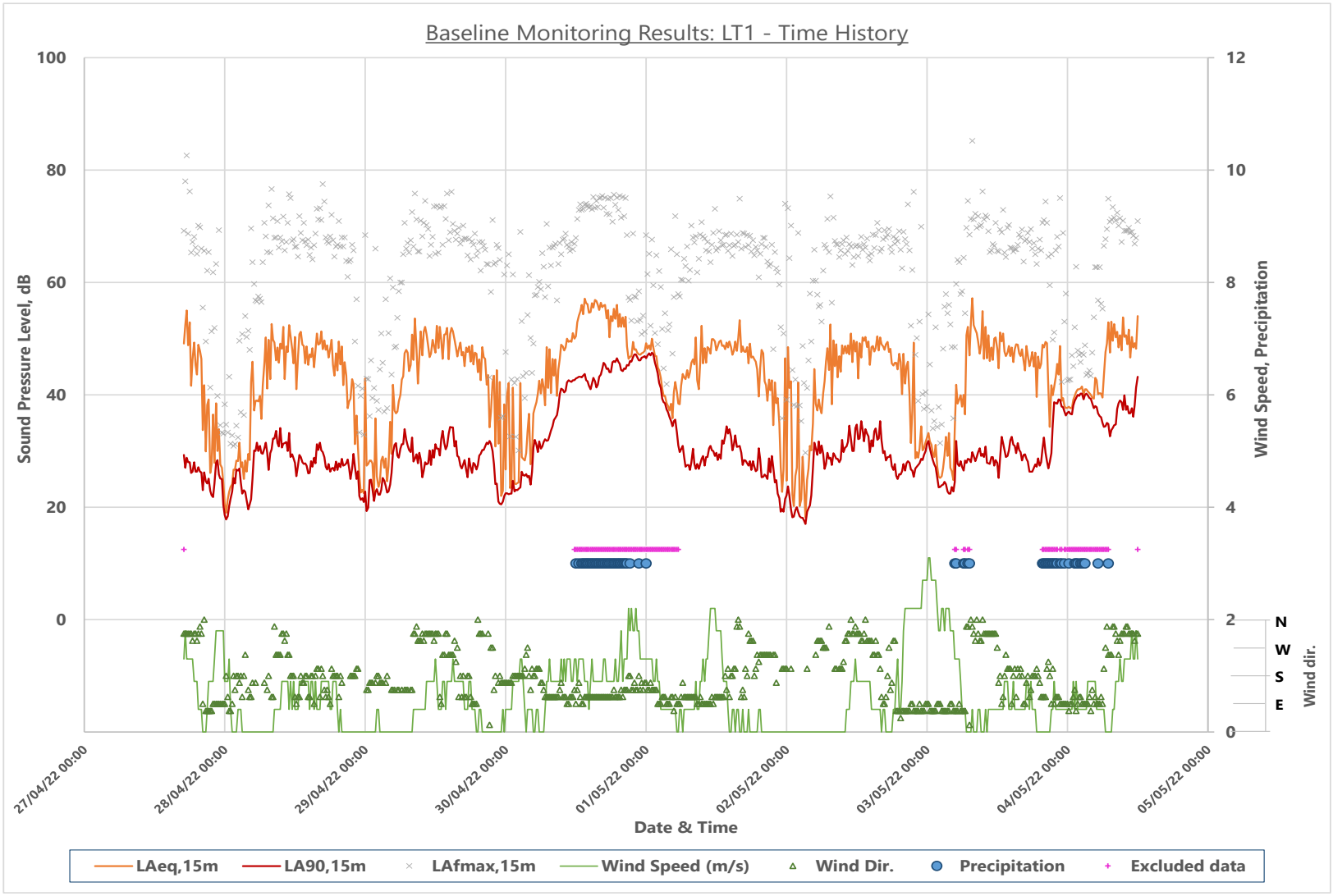


Table 3.2 Summary of measured sound levels at LT1: weekdays

	Background sound level, dB $L_{A90,T}$			Residual sound level, dB $L_{Aeq,T}$			Maximum sound level, dB $L_{AFmax,T}$		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Range	25 - 41	21 - 39	17 - 38	38 - 57	26 - 50	18 - 51	56 - 85	39 - 76	30 - 73
25th percentile	28	26	22	47	36	26	66	62	38
Median	30	27	24	48	42	29	68	66	49
75th percentile	32	28	29	50	46	38	71	67	58
Arithmetic average	30	27	25	48	40	32	69	62	49
Logarithmic average	-	-	-	49	44	38	-	-	-

Table 3.3 Summary of measured sound levels at LT1: weekend

	Background sound level, dB $L_{A90,T}$			Residual sound level, dB $L_{Aeq,T}$			Maximum sound level, dB $L_{AFmax,T}$		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Range	26 - 43	22 - 31	19 - 32	40 - 53	35 - 48	23 - 47	57 - 75	48 - 68	30 - 74
25th percentile	28	25	23	46	39	27	66	62	44
Median	30	26	26	48	42	37	67	64	57
75th percentile	34	27	30	49	43	41	68	66	61
Arithmetic average	32	26	26	47	41	34	67	63	53
Logarithmic average	-	-	-	48	43	39	-	-	-

Table 3.4 Summary of measured sound levels at LT1: Weekend daytimes

	Background sound level, dB $L_{A90,T}$		Residual sound level, dB $L_{Aeq,T}$		Maximum sound level, dB $L_{AFmax,T}$	
	Saturday 0700 - 1900 hrs	Sunday 0700 - 1900 hrs	Saturday 0700 - 1900 hrs	Sunday 0700 - 1900 hrs	Saturday 0700 - 1900 hrs	Sunday 0700 - 1900 hrs
Range	32 - 43	26 - 34	40 - 51	41 - 53	57 - 70	60 - 75
25th percentile	35	28	45	46	65	66
Median	40	29	48	48	66	67
75th percentile	42	31	49	49	67	68
Arithmetic average	38	29	47	48	66	67
Logarithmic average	-	-	48	48	-	-

Figure 3.2 Results of long-term monitoring: LT1 – Distribution of measured residual sound levels, all days

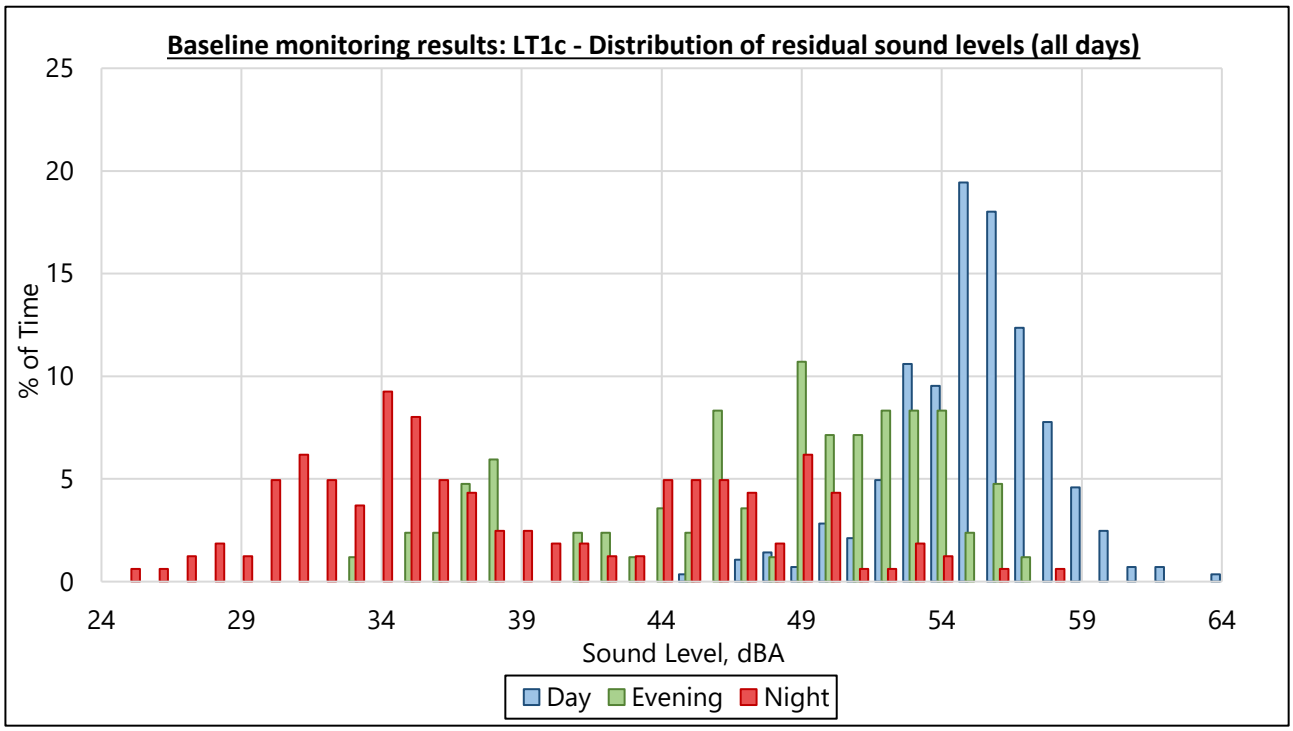
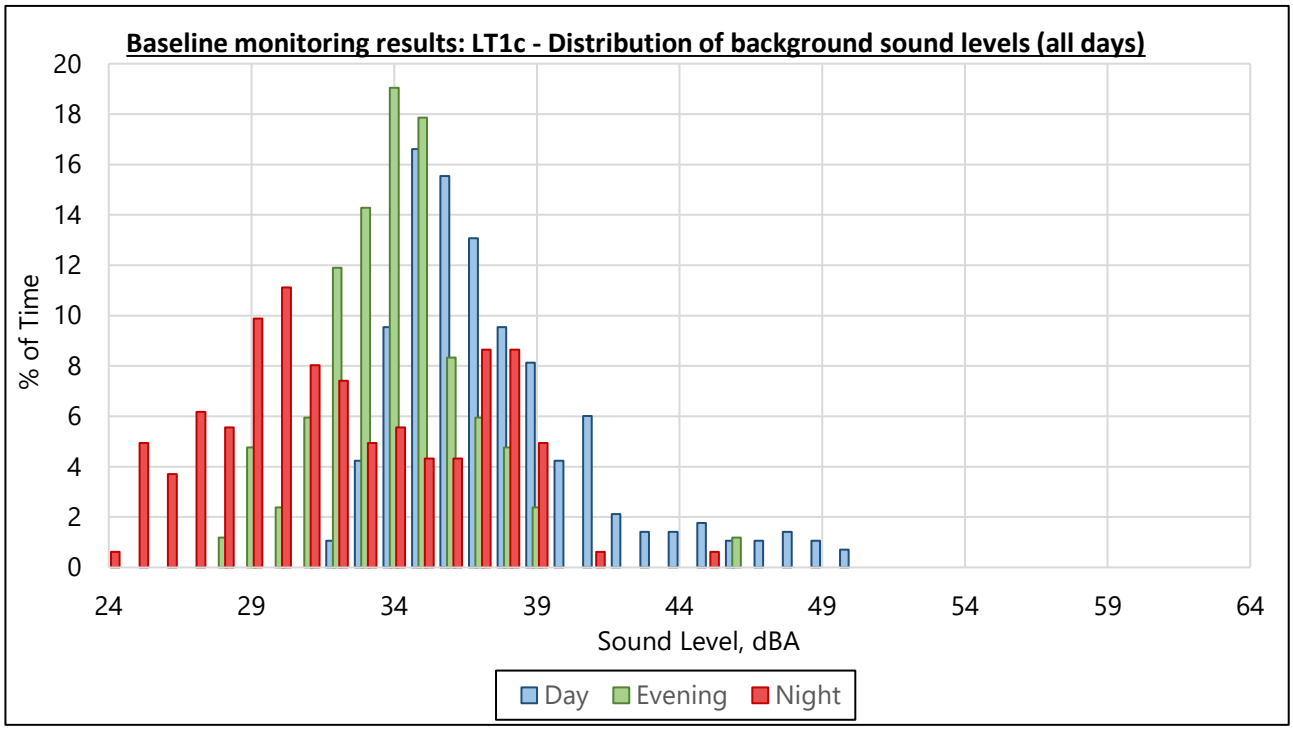


Figure 3.3 Results of long-term monitoring: LT1 – Distribution of measured background sound levels, all days



LT2

3.2.3 The time history chart indicating the measured sound levels over the whole monitoring period at LT2 is presented in **Figure 3.4**. Summaries of the results for weekdays and the weekend are presented in **Table 3.5**, **Table 3.6** and **Table 3.7**. Distribution charts are shown in **Figure 3.5** and **Figure 3.6**.

Figure 3.4 Results of long-term monitoring: LT2 – Time history

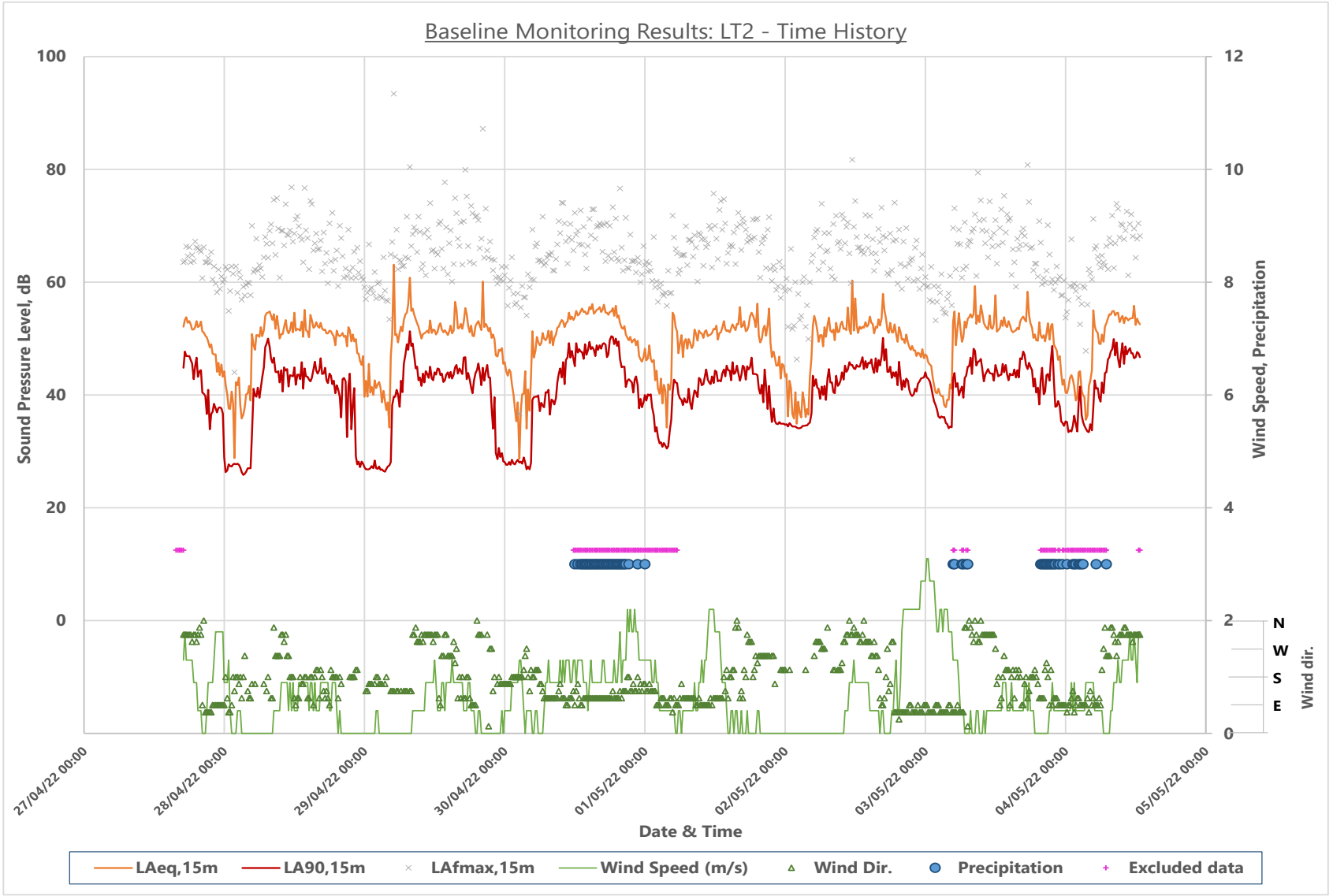


Table 3.5 Summary of measured sound levels at LT2: weekdays

	Background sound level, dB $L_{A90,T}$			Residual sound level, dB $L_{Aeq,T}$			Maximum sound level, dB $L_{AFmax,T}$		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Range	39 - 51	28 - 47	26 - 46	50 - 61	44 - 60	29 - 63	59 - 82	58 - 87	44 - 93
25th percentile	43	38	28	52	49	40	65	62	58
Median	45	41	35	52	50	43	68	64	60
75th percentile	46	43	40	54	52	48	70	66	63
Arithmetic average	45	40	34	53	50	44	68	65	61
Logarithmic average	-	-	-	53	51	48	-	-	-

Table 3.6 Summary of measured sound levels at LT2: the weekend

	Background sound level, dB $L_{A90,T}$			Residual sound level, dB $L_{Aeq,T}$			Maximum sound level, dB $L_{AFmax,T}$		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Range	37 - 49	35 - 45	27 - 40	48 - 56	45 - 56	29 - 51	60 - 76	59 - 72	37 - 72
25th percentile	41	37	28	51	47	40	65	62	58
Median	43	39	29	52	50	45	68	64	61
75th percentile	45	42	39	53	52	49	70	68	64
Arithmetic average	43	39	33	52	50	44	68	65	61
Logarithmic average	-	-	-	52	51	46	-	-	-

Table 3.7 Summary of measured sound levels at LT2: weekend daytimes

	Background sound level, dB $L_{A90,T}$		Residual sound level, dB $L_{Aeq,T}$		Maximum sound level, dB $L_{AFmax,T}$	
	Saturday 0700 - 1900 hrs	**Sunday 0700 - 1900 hrs**	**Saturday 0700 - 1900 hrs**	**Sunday 0700 - 1900 hrs**	**Saturday 0700 - 1900 hrs**	**Sunday 0700 - 1900 hrs**
Range	37 - 49	38 - 47	49 - 55	48 - 56	62 - 74	60 - 76
25th percentile	40	42	50	51	64	66
Median	42	43	52	52	67	68
75th percentile	46	44	53	52	70	70
Arithmetic average	43	43	52	51	67	68
Logarithmic average	-	-	52	52	-	-

Figure 3.5 Results of long-term monitoring: LT2 – Distribution of measured residual sound levels, all days

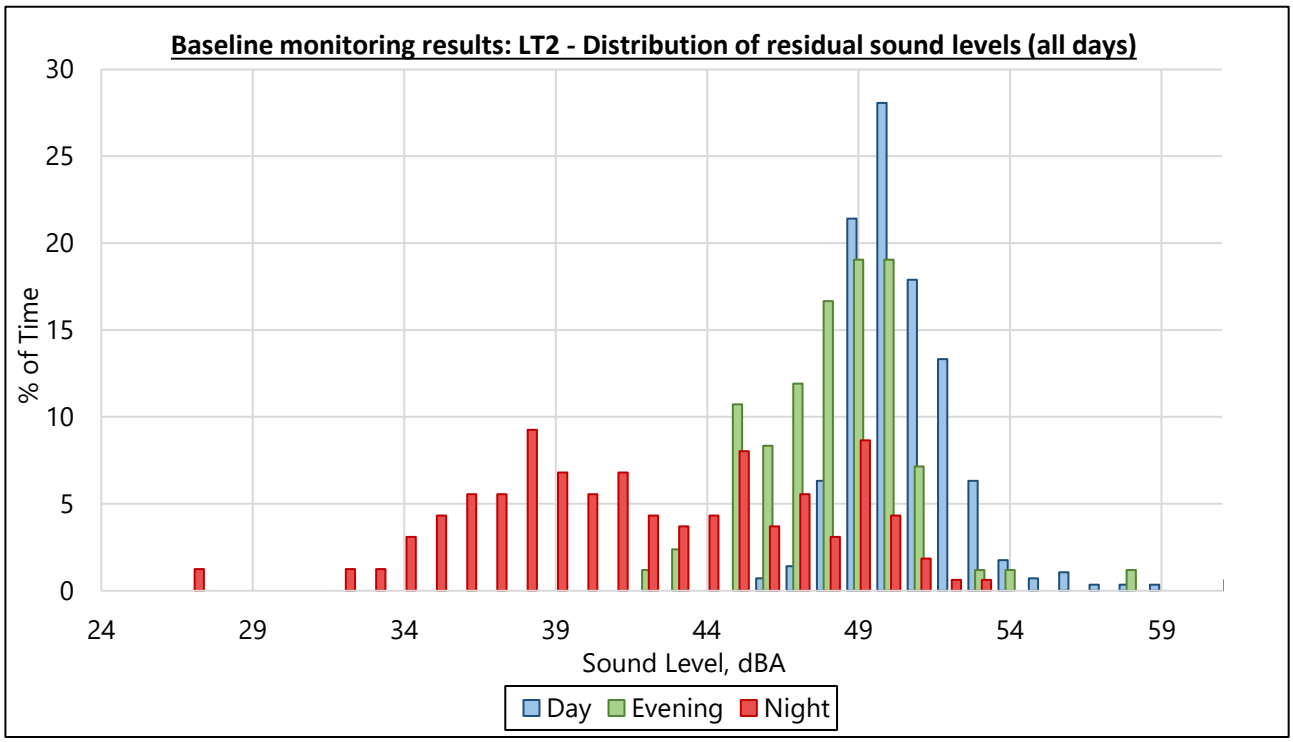
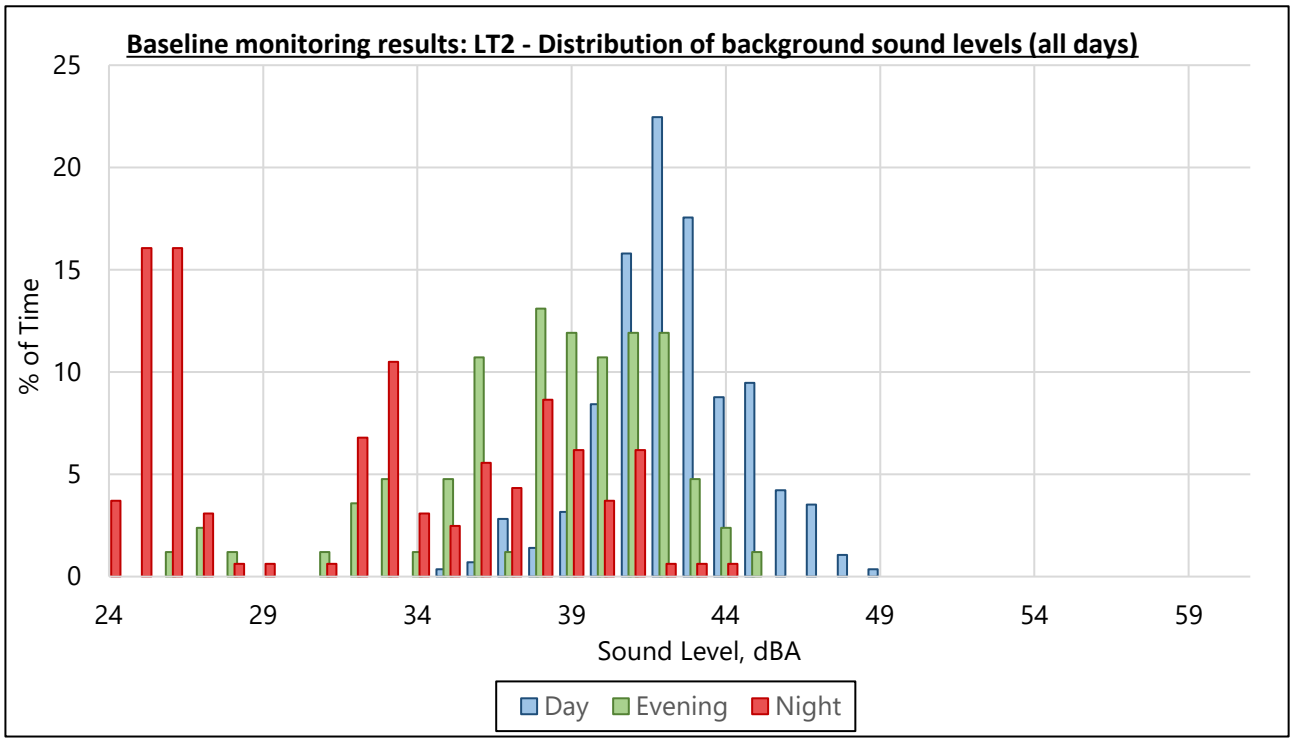


Figure 3.6 Results of long-term monitoring: LT2 – Distribution of measured background sound levels, all days



LT3

3.2.4 The time history chart indicating the measured sound levels over the whole monitoring period at LT3 is presented in **Figure 3.7**. Summaries of the results for weekdays and the weekend are presented in **Table 3.8**, **Table 3.9** and **Table 3.10**. Distribution charts are shown in **Figure 3.8** and **Figure 3.9**.

Figure 3.7 Results of long-term monitoring: LT3 – Time history

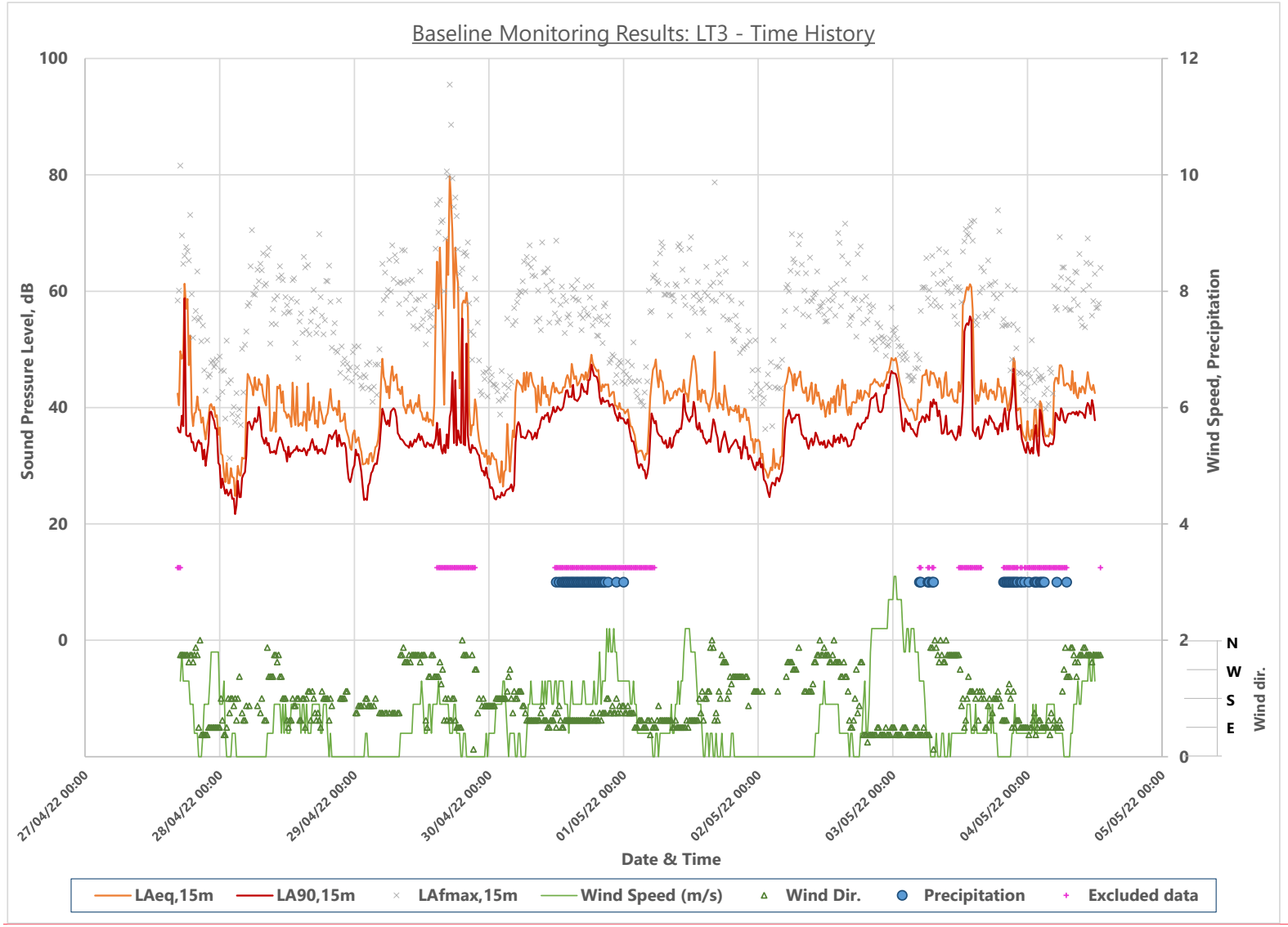


Table 3.8 Summary of measured sound levels at LT3: weekdays

	Background sound level, dB $L_{A90,T}$			Residual sound level, dB $L_{Aeq,T}$			Maximum sound level, dB $L_{AFmax,T}$		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Range	31 - 59	29 - 43	22 - 46	36 - 61	32 - 45	25 - 49	49 - 74	42 - 70	31 - 71
25th percentile	34	33	28	40	38	31	56	48	44
Median	35	35	32	42	40	35	59	52	47
75th percentile	37	39	38	44	43	44	63	57	56
Arithmetic average	35	36	33	42	40	37	60	53	50
Logarithmic average	-	-	-	45	41	42	-	-	-

Table 3.9 Summary of measured sound levels at LT3: the weekend

	Background sound level, dB $L_{A90,T}$			Residual sound level, dB $L_{Aeq,T}$			Maximum sound level, dB $L_{AFmax,T}$		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Range	32 - 42	31 - 35	24 - 38	39 - 50	34 - 40	26 - 48	52 - 79	43 - 65	39 - 68
25th percentile	35	33	26	41	38	31	58	51	44
Median	36	33	28	43	39	35	60	52	47
75th percentile	38	34	35	44	40	44	64	55	60
Arithmetic average	36	33	30	43	39	37	61	53	52
Logarithmic average	-	-	-	43	39	41	-	-	-

Table 3.10 Summary of measured sound levels at LT3: weekend daytimes

	Background sound level, dB $L_{A90,T}$		Residual sound level, dB $L_{Aeq,T}$		Maximum sound level, dB $L_{AFmax,T}$	
	Saturday 0700 - 1900 hrs	Sunday 0700 - 1900 hrs	Saturday 0700 - 1900 hrs	Sunday 0700 - 1900 hrs	Saturday 0700 - 1900 hrs	Sunday 0700 - 1900 hrs
Range	35 - 40	32 - 42	39 - 46	39 - 50	53 - 68	52 - 79
25th percentile	36	34	42	41	59	58
Median	38	36	44	42	63	60
75th percentile	39	37	44	43	64	63
Arithmetic average	37	36	43	43	61	61
Logarithmic average	-	-	43	43	-	-

Figure 3.8 Results of long-term monitoring: LT3 – Distribution of measured residual sound levels, all days

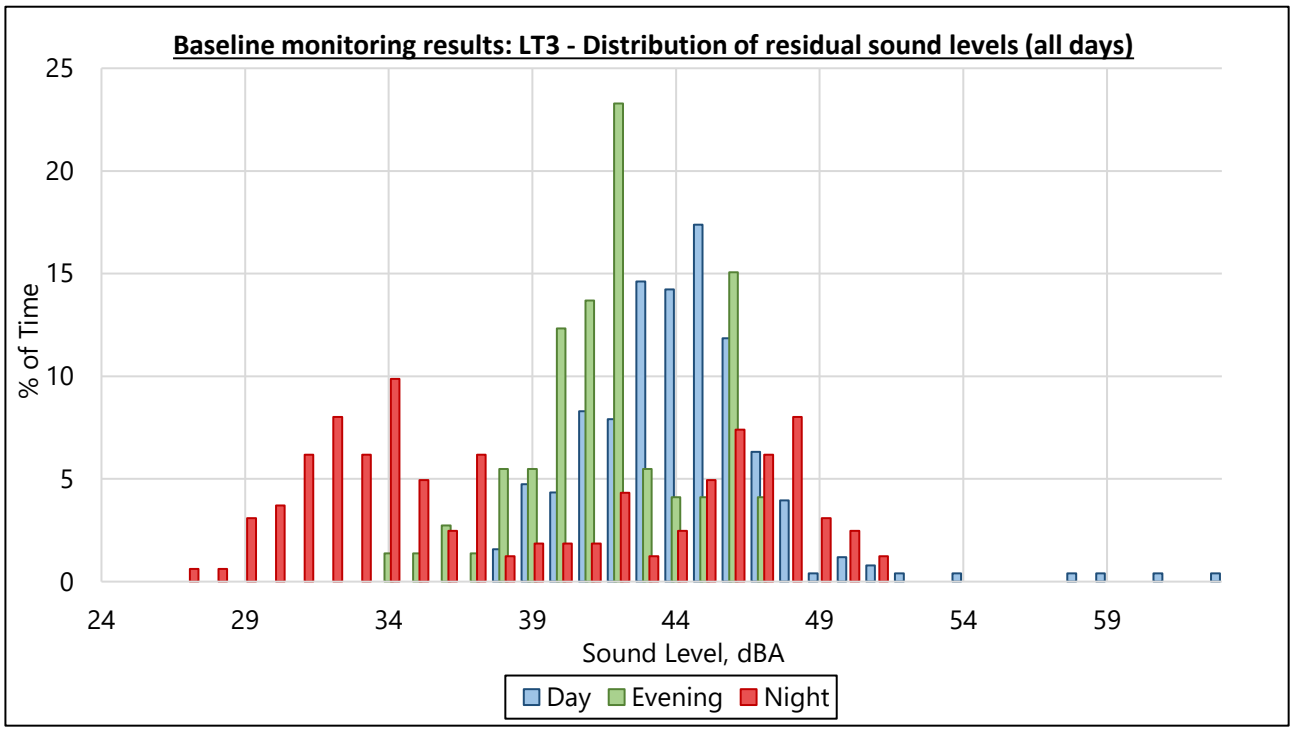
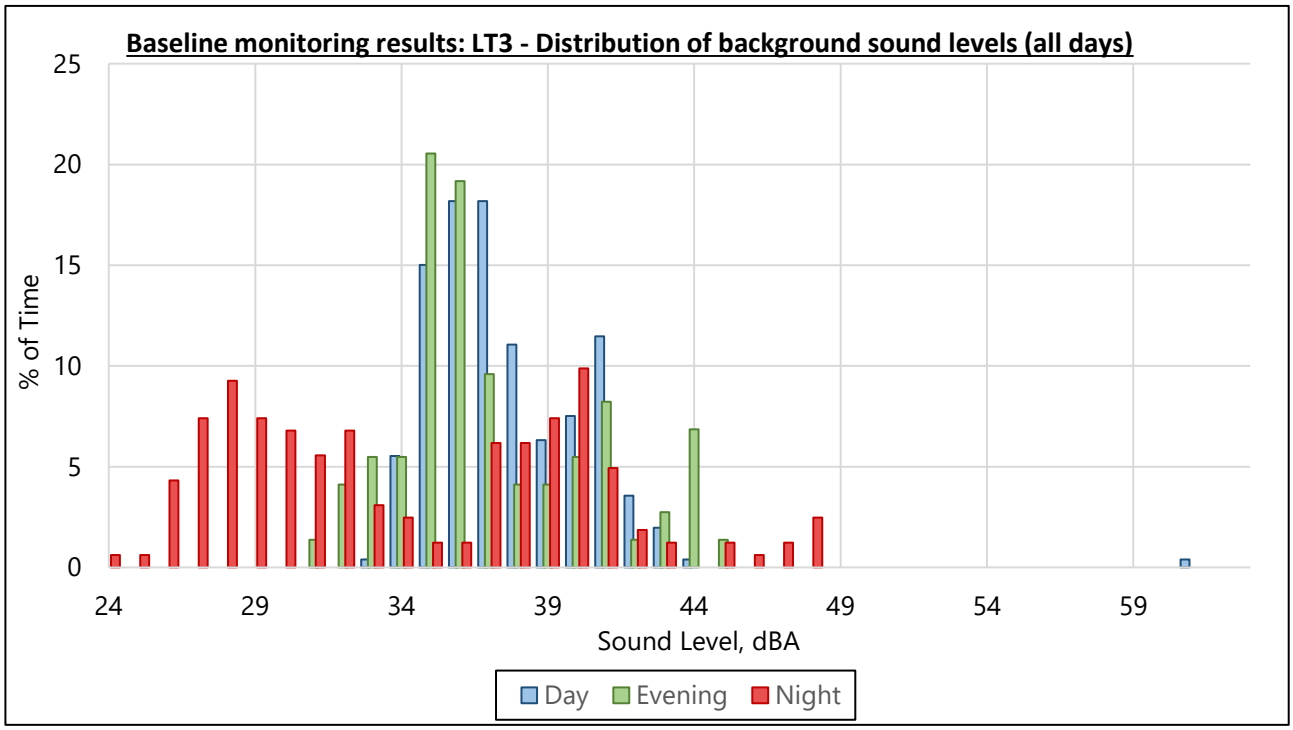


Figure 3.9 Results of long-term monitoring: LT3 – Distribution of measured background sound levels, all days



LT4

3.2.5 The time history chart indicating the measured sound levels over the whole monitoring period at LT4 is presented in **Figure 3.10**. Summaries of the results for weekdays and the weekend are presented in **Table 3.11**, **Table 3.12** and **Table 3.13**. Distribution charts are shown in **Figure 3.11** and **Figure 3.12**.

Figure 3.10 Results of long-term monitoring: LT4 – Time history

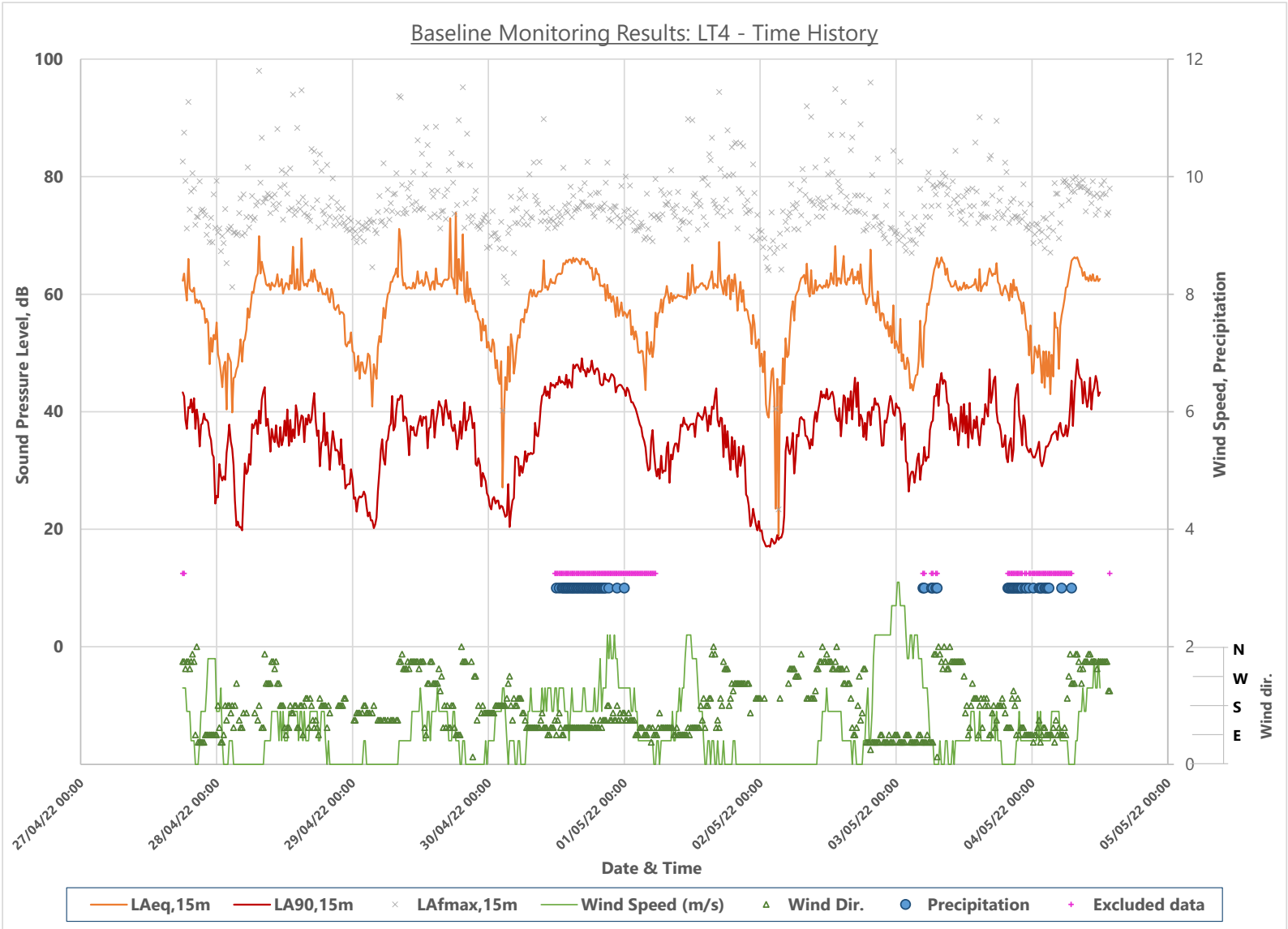


Table 3.11 Summary of measured sound levels at LT4: weekdays

	Background sound level, dB $L_{A90,T}$			Residual sound level, dB $L_{Aeq,T}$			Maximum sound level, dB $L_{AFmax,T}$		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Range	31 - 49	27 - 42	17 - 43	58 - 74	48 - 70	19 - 64	71 - 103	69 - 96	23 - 84
25th percentile	37	34	24	61	57	47	74	72	70
Median	39	38	30	62	59	50	77	74	71
75th percentile	42	40	34	63	60	54	79	78	73
Arithmetic average	39	37	29	63	59	50	78	76	71
Logarithmic average	-	-	-	63	60	54	-	-	-

Table 3.12 Summary of measured sound levels at LT4: the weekend

	Background sound level, dB $L_{A90,T}$			Residual sound level, dB $L_{Aeq,T}$			Maximum sound level, dB $L_{AFmax,T}$		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Range	28 - 45	21 - 36	20 - 33	58 - 69	52 - 63	27 - 59	69 - 94	70 - 86	40 - 78
25th percentile	34	25	23	60	57	48	73	74	70
Median	38	31	25	61	58	52	75	78	72
75th percentile	39	33	30	62	61	55	79	85	74
Arithmetic average	37	29	26	61	59	51	77	79	71
Logarithmic average	-	-	-	61	60	53	-	-	-

Table 3.13 Summary of measured sound levels at LT4: weekend daytimes

	Background sound level, dB $L_{A90,T}$		Residual sound level, dB $L_{Aeq,T}$		Maximum sound level, dB $L_{AFmax,T}$	
	Saturday 0700 - 1900 hrs	**Sunday 0700 - 1900 hrs**	**Saturday 0700 - 1900 hrs**	**Sunday 0700 - 1900 hrs**	**Saturday 0700 - 1900 hrs**	**Sunday 0700 - 1900 hrs**
Range	33 - 45	28 - 44	58 - 66	59 - 69	71 - 90	69 - 94
25th percentile	34	34	60	60	73	74
Median	41	38	61	61	74	75
75th percentile	43	39	62	62	76	80
Arithmetic average	39	37	61	61	76	77
Logarithmic average	-	-	61	62	-	-

Figure 3.11 Results of long-term monitoring: LT4 – Distribution of measured residual sound levels, all days

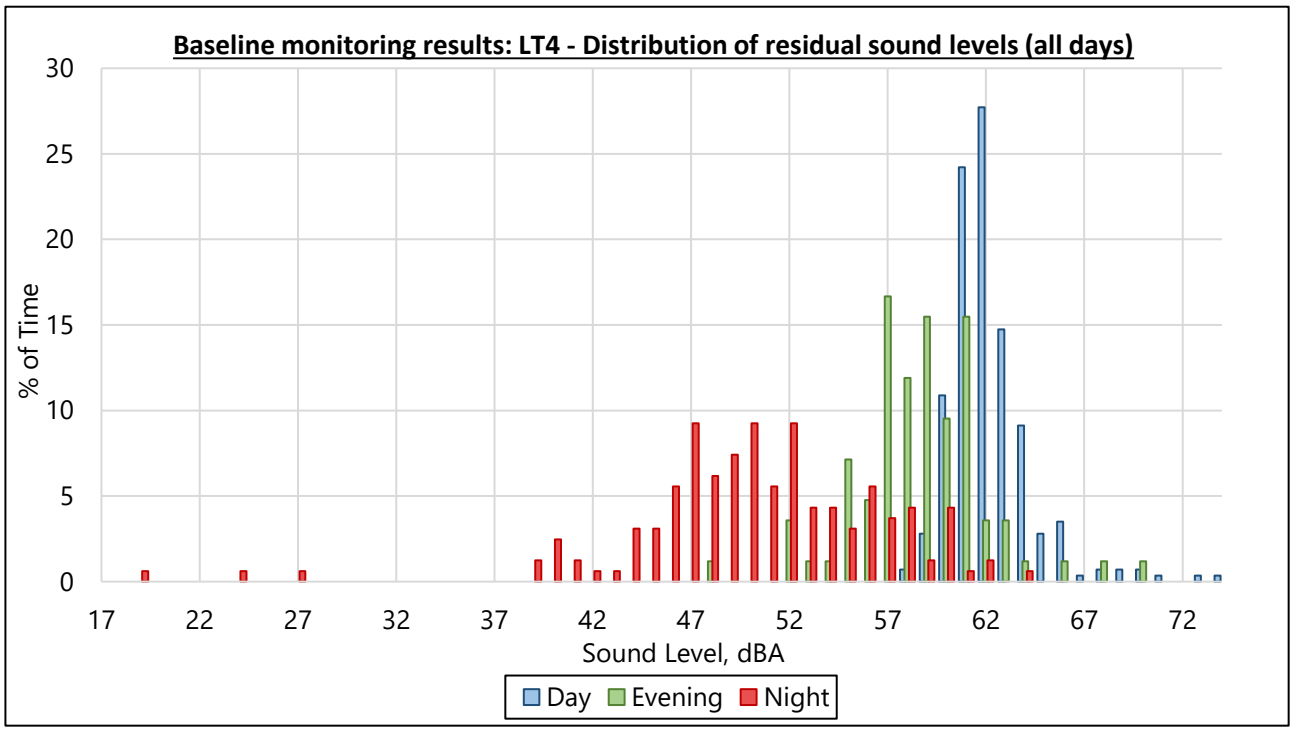
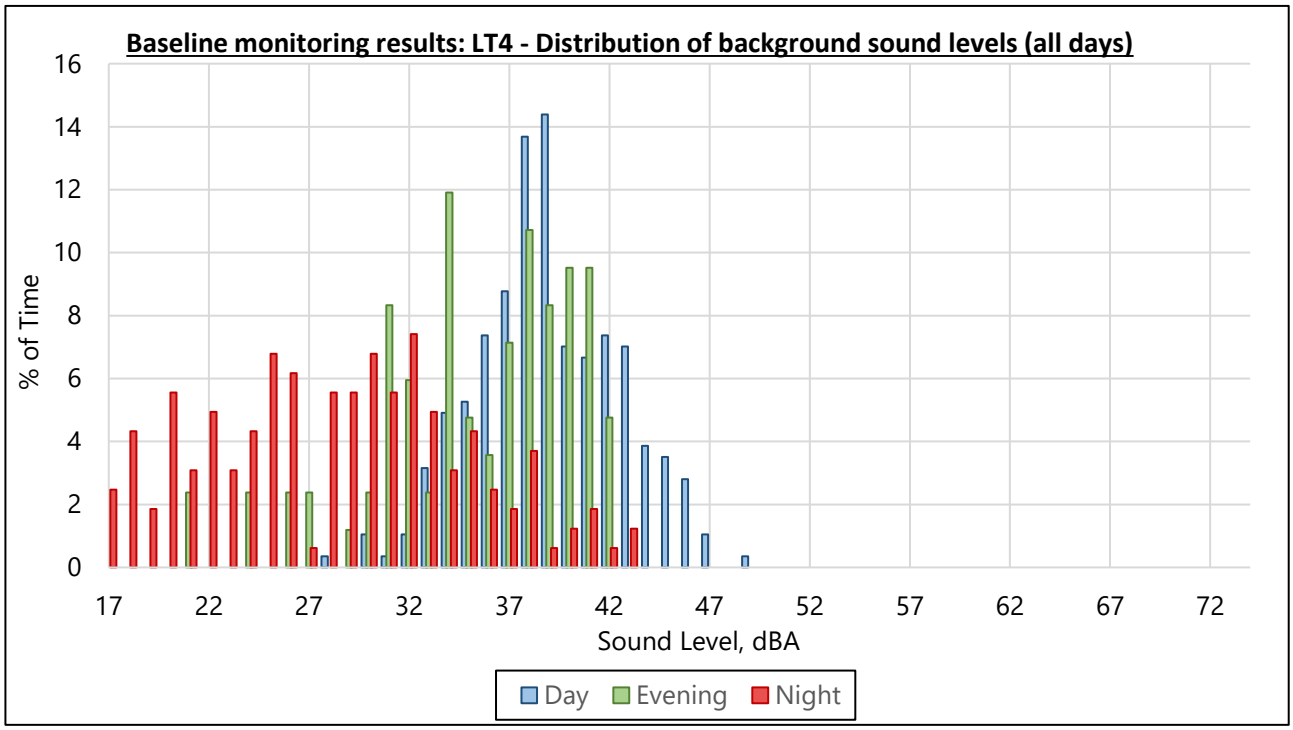


Figure 3.12 Results of long-term monitoring: LT4 – Distribution of measured background sound levels, all days



3.3 Short-term measurements

3.3.1 Short term measurements were undertaken at four locations (see **Figure 2.1**) as set out in **Table 2.1**. Summaries of the results of the short-term measurements are provided below in **Table 3.14** to **Table 3.17**, with full details provided in **Appendix B**.

3.3.2 The short-term monitoring result summaries present the results of the individual measurements, along with the averages for daytime and night-time. For the average results, $L_{Aeq,T}$ sound levels have been logarithmically averaged, statistical sound levels ($L_{An,T}$) have been arithmetically averaged, and the range of measured L_{Amax} levels has been reported.

Table 3.14 Summary of measured sound levels at ST1

Start Date & Time	Period[1]	Sound Pressure Level, dB $L_{Aeq,T}$	$L_{Amax,T}$	$L_{A10,T}$	$L_{A50,T}$	$L_{A90,T}$	Comments (Including reasons for pausing audible noise sources etc.)
28/04/2022 14:21	D	46	72	47	44	42	Road noise dominant. Engine beating noise from south. Distant lawnmower/leafblower. Bird calls. Pauses for talking and local vehicle movements/ activity.
28/04/2022 11:05	D	44	61	47	43	39	
28/04/2022 17:10	D	42	59	44	41	38	
27/04/2022 23:16*	N	42	59	45	39	38	Road noise dominant. Wind in flora contributing. Slight hum from unidentified source. * - measurement excluded due to influence of wind noise.
28/04/2022 00:13	N	34	48	37	30	28	
28/04/2022 01:07	N	36	52	39	30	28	
Daytime, all samples		44	59 - 72	46	43	40	
Night-time, all samples		35	48 - 52	38	30	28	

1 D= Day, N= Night

Table 3.15 Summary of measured sound levels at ST2

Start Date & Time	Period	Sound Pressure Level, dB $L_{Aeq,T}$	$L_{Amax,T}$	$L_{A10,T}$	$L_{A50,T}$	$L_{A90,T}$	Comments (Including reasons for pausing audible noise sources etc.)
28/04/2022 15:33	D	62	75	67	57	43	Road noise dominant. Gardening tools audible. Bird calls audible. Pauses for cars.
28/04/2022 12:28	D	61	76	65	54	43	
28/04/2022 18:17	D	57	77	62	50	41	
27/04/2022 23:44*	N	49	71	50	46	41	Road noise dominant. Slight hum from unidentified source audible. * - measurement excluded due to influence of wind noise.
28/04/2022 00:43	N	33	49	37	28	24	
28/04/2022 01:31	N	33	50	36	32	28	
Daytime, all samples		60	75 - 77	65	54	42	
Night-time, all samples		33	49 - 50	36	30	26	

Table 3.16 Summary of measured sound levels at ST3

Start Date & Time	Period	Sound Pressure Level, dB $L_{Aeq,T}$	$L_{Amax,T}$	$L_{A10,T}$	$L_{A50,T}$	$L_{A90,T}$	Comments (Including reasons for pausing, audible noise sources etc.)
28/04/2022 11:11	D	46	66	51	38	30	Local and distant road noise dominant. Bird calls. Dogs barking. Reversing alarm. Dump truck movement for nearby yard. Pauses for reversing plant machinery.
28/04/2022 16:54	D	43	64	46	34	28	
28/04/2022 14:04	D	37	61	40	33	28	
27/04/2022 23:16	N	29	43	32	26	25	Low frequency noise with some amplitude modulation (beating/ pulsating). Likely plane/boat engines in distance.
28/04/2022 00:24	N	27	47	30	25	23	
28/04/2022 01:26	N	24	36	26	23	22	

Start Date & Time	Period	Sound Pressure Level, dB $L_{Aeq,T}$	$L_{Amax,T}$	$L_{A10,T}$	$L_{A50,T}$	$L_{A90,T}$	Comments (Including reasons for pausing, audible noise sources etc.)
Daytime, all samples		43	61 - 66	45	35	29	
Night-time, all samples		27	36 - 47	29	25	23	

Table 3.17 Summary of measured sound levels at ST4

Start Date & Time	Period	Sound Pressure Level, dB $L_{Aeq,T}$	$L_{Amax,T}$	$L_{A10,T}$	$L_{A50,T}$	$L_{A90,T}$	Comments (Including reasons for pausing, audible noise sources etc.)
28/04/2022 12:41	D	44	65	47	37	31	Road noise. Aeroplane. Bird calls. Distant construction works. Pauses for construction noise, dog walker, aeroplane
28/04/2022 18:07	D	34	59	36	30	25	
28/04/2022 15:42	D	33	58	34	28	24	
27/04/2022 23:54	N	30	44	31	30	29	road traffic noise Irvine Road fan turbine noise fan turbine noise
28/04/2022 00:55	N	30	42	31	30	29	
28/04/2022 01:53	N	30	47	31	30	29	
Daytime, all samples		40	58 - 65	39	32	27	
Night-time, all samples		30	42 - 47	31	30	29	

4. Discussion

4.1 Analysis of results

Long-term monitoring locations

LT1

4.1.1 The time history chart in **Figure 3.1** indicates a typical diurnal variation, with some night-time periods influenced by local activity/events which may relate to transport sources or sound from the sea. The data exclusions show that samples have been removed for precipitation, and for unrepresentative activity during the installation and decommissioning of the instrumentation.

4.1.2 The distribution charts indicate a typical distribution of residual sound levels. **Figure 3.2** indicates that daytime residual sound levels are greatest, with reduced residual sound levels in the evening, and much lower residual sound levels at night-time.

4.1.3 The distribution of background sound levels shown in **Figure 3.3** also shows that day, evening and night-time background sound levels follow a typical order of magnitudes, but with a much-reduced spread. Additionally, the distribution reflects low background sound levels indicative of a rural area, influenced by continual noise from the sea.

4.1.4 The summaries provided in **Table 3.2**, **Table 3.3** and **Table 3.4** indicate a fairly substantial inter-quartile range (IQR)[7] in night-time background sound levels and in evening and night-time residual sound levels. Generally, where the IQR is relatively substantial (for example, around 10 dB) it is considered that median sound levels are robustly representative, and where the IQR is more limited (for example, around 5 dB) that the 25th percentile sound levels are robustly representative.

LT2

4.1.5 The time history chart in **Figure 3.4** indicates a typical diurnal variation. The data exclusions show that samples have been removed for precipitation, and for unrepresentative activity during the installation and decommissioning of the instrumentation.

4.1.6 The distribution of residual sound levels in **Figure 3.5** indicates that daytime and evening residual sound levels are similar, with reduced residual sound levels in the night-time. The distribution of residual sound levels in the night-time appears partially bimodal[8] (i.e., indicating that, during the monitoring period, semi-continuous sources may have been contributing at all times of day at a level of around 50 dBA).

4.1.7 The distribution of background sound levels shown in **Figure 3.6** shows that evening background sound levels are slightly lower than during the daytime. A partially bimodal presentation of night-time background sound levels further indicates the presence of a semi-continuous source during the whole monitoring period, with a significant portion of night-time background sound levels similar to evening background sound levels, and a

[7] The interquartile range is the body of data between the 25th and 75th percentiles – this is a way of determining the relative spread of the data whilst disregarding the influence of outliers on the overall data.
[8] The data shows two distinct peaks.

much lower group of night-time background sound levels around 25 – 26 dBA. The bimodal nature could be indicative of the influence of wind in flora.

4.1.8 The summaries provided in **Table 3.5**, **Table 3.6** and **Table 3.7** generally indicate limited IQR's during daytimes and evenings, with a greater variation, and hence relatively more substantial IQR's, during night-times. During daytimes and evenings, the 25th percentile residual and background sound levels are considered to be robustly representative. During night-times, where the data indicates relatively substantial IQR's (for example, around 10 dB) it is considered that median sound levels are robustly representative.

LT3

4.1.9 The time history chart in **Figure 3.7** indicates a typical diurnal variation, with some unrepresentative events on the 29 April 2022 and 3 May 2022. The locations notes (presented in **Appendix B**) indicate that a film crew were setting up in the vicinity on the 28 April 2022. It is therefore anticipated that the unrepresentative periods are due to a film crew working in the area. The precise cause of the unrepresentative event on 3 May is unknown. The data exclusions in **Figure 3.7** show that samples have been removed for precipitation, for the unrepresentative events due to local activity and for activity during the installation and decommissioning of the instrumentation.

4.1.10 The distribution of residual sound levels in **Figure 3.8** indicates that evening sound levels are slightly lower than during the daytime. Residual sound levels in the night-time present a bimodal pattern of distribution. The lower peak in the night-time is approximately 10 dB lower than the evening and daytime peaks, with the upper night-time peak approximately 3 dB greater than the daytime and evening peaks. The cause of the bimodal distribution could be partly due to weather; the highest average wind speeds are observed at around 00:00 hrs on 3 May 2022. There is correlation with increased average wind speeds and night-time residual sound levels on the first night-time period commencing 27 May 2022.

4.1.11 The distribution of background sound levels shown in **Figure 3.9** follows a similar pattern to the distribution of residual sound levels: the distribution of day and evening background sound levels peak at a similar magnitude of around 36 dBA, and night-time background sound levels present a bimodal distribution with peaks at around 28 dBA and 39 dBA.

4.1.12 The summaries provided in **Table 3.8**, **Table 3.9** and **Table 3.10** generally indicate limited IQR's during daytimes and evenings, with a much greater variation during night-times, as is expected based on analysis of the distribution data presented in **Figure 3.11** and **Figure 3.12**. During daytimes and evenings, the 25th percentile residual and background sound levels are considered to be robustly representative. During night-times, where the data indicates relatively substantial IQR's (for example, around 10 dB) it is considered that median sound levels are robustly representative.

LT4

4.1.13 The time history chart in **Figure 3.10** indicates a typical diurnal variation, with some night-time periods, particularly the first night (commencing 27 April 2022) showing slightly elevated sound levels. The data exclusions show that samples have been removed for precipitation, and for unrepresentative activity during the installation and decommissioning of the instrumentation.

4.1.14 The distribution charts indicate a typical distribution of residual sound levels. **Figure 3.11** indicates that daytime residual sound levels are the greatest, with reduced residual sound levels in the evening, and much lower residual sound levels at night-time.

4.1.15 The distribution of background sound levels (see **Figure 3.12**) indicates that day, evening and night-time background sound levels follow a typical order of magnitude. Day and

evening background sound levels are similar (with the majority of daytime and evening background sound level samples falling between 36 and 43 dBA), with reduced background sound levels in the night-time period.

4.1.16 The summaries provided in **Table 3.11**, **Table 3.12** and **Table 3.13** indicate relatively substantial IQR' in the evening and night-time background sound levels and in night-time residual sound levels. Generally, where the IQR is relatively substantial (for example, around 10 dB) it is considered that median sound levels are robustly representative, and where the IQR is more limited (for example, around 5 dB) that the 25th percentile sound levels are robustly representative.

Short-term monitoring locations

ST1

4.1.17 The measurement data presented in **Table 3.14** shows a typical diurnal variation in sound levels. With reference to the average sound levels, residual and background sound levels during the daytime are approximately 10 dB greater than at night-time.

4.1.18 Individual daytime and night-time residual sound levels are generally similar throughout, except in one night-time measurement, influenced by elevated wind speeds, which was excluded from the calculation of the average sound levels.

ST2

4.1.19 The measurement data presented in **Table 3.15** shows a typical diurnal variation in sound levels, with a pronounced difference in daytime and night-time sound levels as compared to ST1. This is likely due to the much greater contribution of road traffic noise from Irvine Road at ST2[9]. With reference to the average sound levels, daytime residual sound levels at ST2 are around 30 dB greater than at night-time, and daytime background sound levels are around 15 dB greater than at night-time.

4.1.20 Individual daytime and night-time residual sound levels are generally similar throughout, except in one night-time measurement, influenced by elevated wind speeds, which was excluded from the calculation of the average sound levels.

ST3

4.1.21 The measurement data presented in **Table 3.16** shows a typical diurnal variation in residual sound levels, but with less variation in daytime and night-time background sound levels, which is indicative of a rural location. With reference to the average sound levels, daytime residual sound levels are around 15 dB greater than during the night-time and background sound levels are around 6 dB greater during the daytime than at night-time.

4.1.22 Individual daytime and night-time measurements are generally of a consistent level.

ST4

4.1.23 The measurement data presented in **Table 3.17** shows a typical diurnal variation in residual sound levels, but with very similar background sound levels in the daytime and night-time. With reference to the average sound levels, residual sound levels during the day are around 10 dB greater than during the night-time. Atypically, background sound levels are 2 dB greater during the night-time than during the daytime. However, in

[9] Monitoring equipment at ST2 was located approximately 10m from Irvine Road, whereas monitoring equipment at ST1 was set back by approximately 120m from Irvine Road and had a number of intervening structures.

absolute terms, average background sound levels are very low, being between 27 dBA to 29 dBA, which is commensurate with the location of ST4 being very rural, adjacent to the coast and not in proximity to any significant transport links.

4.1.24 Individual daytime and night-time residual sound levels are generally consistent throughout each period, with night-time sound levels displaying identical measured background and residual sound levels in all samples.

4.2 Comparisons and corrections

ST3 and LT3

4.2.1 Due to the proximity of LT3 and ST3, a comparison was made between measured sound levels acquired at these locations, in an effort to identify any correlation. Limited sampling was undertaken at ST3 compared to LT3; should any correlation be present then the results acquired at LT3 can be taken as representative of ST3. In such a case, the representative sound levels will be subject to lower uncertainty, owing to the greater number of measurements obtained at the long-term location.

4.2.2 As the 25th percentile data obtained at LT3 is considered to be robust and representative, these values were used in the comparison. The comparison of the monitoring results at ST3 and LT3 is provided in **Table 4.1**.

Table 4.1 Comparison of monitoring results acquired at ST3 and LT3

Period	ST3 Sound Pressure Level, dB		LT3 Sound Pressure Level, dB (25th percentile)		Difference, dB (LT minus ST)	
	$L_{Aeq,T}$	$L_{A90,T}$	$L_{Aeq,T}$	$L_{A90,T}$	$L_{Aeq,T}$	$L_{A90,T}$
Daytime	43	29	40	34	-3	5
Night-time	27	23	31	28	4	5

4.2.3 **Table 4.1** indicates a strong correlation between the night-time background and residual sound levels, and the daytime background. The same correlation is not observed in the daytime residual sound levels and likely due to activity at Thirdpart during the daytime.

4.2.4 Based on the above, it is considered appropriate to correct the 25th percentile sound levels at LT3 to be representative of ST3. The average 5 dB difference noted in **Table 4.1** will be subtracted from the 25th percentile results from LT3 for the night-time background and residual and the daytime background. As there is poor correlation in the daytime residual sound levels, the measured daytime residual sound levels at ST3 will be retained as being representative of receptors in the vicinity of ST3. It is noted that the only influence this will have (as compared to the measured sound levels acquired at ST3) will be to reduce the representative night-time residual sound level at ST3 by 1 dB.

4.3 Representative levels for the assessment

4.3.1 Based on the measured sound levels, presented in **Section 3**, and the discussion, analysis and corrections described in **Section 4**, the representative sound levels to be

used in the forthcoming EIA process and assessment of the Proposed Works are presented in **Table 4.2**.

4.3.2 For the assessment of any activity associated with the Proposed Works which is classed as a 'construction' activity, BS 5228-1:2009+A1:2014 *'Noise and vibration on construction and open sites. Part 1: Noise'*[10] will be used to complete the assessment. Determination of threshold categories, following the guidance contained within Annex E of BS 5228-1, based on the representative baseline sound levels presented in **Table 4.2** is presented subsequently in **Table 4.3**.

[10] British Standards Institution (BSI, 2014) *British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*. London, BSI.

Table 4.2 Representative baseline sound levels

Survey Location	Representative baseline ambient sound levels, dB $L_{Aeq,T}$									Representative baseline background sound levels, dB $L_{A90,T}$					
	Weekdays				Weekends					Weekdays			Weekends		
	Day	Evening	Night	Mon - Fri 0700 - 1900 hrs*	Day	Evening	Night	Saturday 0700 - 1900 hrs*	Sunday 0700 - 1900 hrs*	Day	Evening	Night	Day	Evening	Night
LT1	47	42	29	48	46	39	37	48	48	28	26	24	28	25	26
LT2	52	49	43	52	51	47	45	52	52	43	38	35	41	37	29
LT3	40	38	35	43	41	38	35	43	43	34	33	32	35	33	28
LT4	61	57	50	61	60	57	52	61	62	37	34	30	34	25	25
ST1	44	-	35	44	-	-	-	-	-	40	-	28	-	-	-
ST2	60	-	33	60	-	-	-	-	-	42	-	26	-	-	-
ST3	43	-	26	43	-	-	-	-	-	29	-	23	-	-	-
ST4	40	-	30	40	-	-	-	-	-	27	-	29	-	-	-

*** - Logarithmic average, for determination of BS 5228-1 threshold category values.**

Table 4.3 Determination of BS 5228-1 threshold categories

Survey Location	BS 5228-1 Threshold of significance Category			BS 5228-1 Threshold of significance Category			BS 5228-1 Threshold of significance, dB $L_{Aeq,T}$			BS 5228-1 Threshold of significance, dB $L_{Aeq,T}$		
	Weekdays			Weekends*			Weekdays			Weekends*		
	Day	Evening	Night	Mon - Fri 0700 - 1900 hrs	Saturday 0700 - 1900 hrs	Sunday 0700 - 1900 hrs	Day	Evening	Night	Saturday 0800 - 1300 hrs	Saturday 1300 - 1600 hrs	Sunday 0700 - 2300 hrs
LT1	A	A	A	A	A	A	65	55	45	55	55	55
LT2	A	A	B	A	A	A	65	55	50	55	55	55
LT3	A	A	A	A	A	A	65	55	45	55	55	55
LT4	A	B	C	A	C	C	65	60	55	55	65	65
ST1	A	A	A	A	A	A	65	55	45	55	55	55
ST2	A	A	A	A	A	A	65	55	45	55	55	55
ST3	A	A	A	A	A	A	65	55	45	55	55	55
ST4	A	A	A	A	A	A	65	55	45	55	55	55

*** - Where no weekend data available, assumed to be same threshold category as during weekdays.**

5. Summary and Conclusions

5.1.1 This report presents the results of the baseline sound level surveys that were conducted between Wednesday 27 April 2022 and Wednesday 4 May 2022 to inform the EIA for the decommissioning of HNB.

5.1.2 All monitoring, and subsequent data processing, analysis and reporting was undertaken in accordance with the relevant British Standards[2,3] as agreed with NAC on 4 February 2022.

5.1.3 The measured sound levels are generally considered to be typical of the locations where the data were acquired. At these locations, the sound levels tended to be dominated by transport noise and/or sound from the sea. Other noise sources were noted (local activity, animal sounds, wind in trees, etc.), however these did not affect the validity of the measurements. Noise sources that are deemed unrepresentative (periods affected by precipitation, noise aircraft etc.) were removed from the datasets.

5.1.4 The measured sound levels are considered to be representative of NSRs in proximity to each measurement location. Therefore, these measured levels will be used to inform the baseline for the noise assessments which will be reported in the ES.

Appendix A
Figure indicating monitoring locations and noise sensitive receptor locations

R:\Projects\807184 HNB & HPB Site Surveys and Engagement\Deliver Stage\D Design_Technical\Drawings\ArcGIS\MXD\807184-WOOD-XX-XX-FG-ON-00001_S2_P01.mxd Originator: jacqui.parkin

215000 216000 217000 218000 219000 220000 221000 222000

654000 653000 652000 651000 650000 649000

N

Millport
Aird Hill
West Bay Rd
Clyde St
Craigengour Hill
Millport Bay
The Tan
Hill of Hills
Little Cumbrae House
Fairlie
Fairlie Glen
North Southannan
Diamond Hill
Southannan Sands
South Lodge
Black Hill
Poteathbank Cottage
Largs Ave
Biglees Farm
Biglees Hill
Glentane Hill
South Kilruskin Farm
Crosbie Dykes
Goldenberry Hill
Ardneil Hill
Waterside Hill
Northbank
Millstonford
Highthorne Cottage
Crosbie Mains Farm
Woodhead Farm
Crosbie Cottage
Bushglen
Stairlie
Croekwood
Carlung
Croek Hill
Glentane Cottage
Carlung House
High Drummilling Farm
Springside
Auld Hill
Ardneil Cottages
Kirkfield House
Whinhurst Coach House
Garroch House
Underhill
Faulds
Law Hill
West Kilbride
B781
B782
B7048
A78
St Bride's Rd
Gateside St

LT1 R1 R2 ST2 R3 ST1 R4 LT2 R5 R6 LT3 R7 R8 R9 R10 R11 ST3 ST4 R12 R15 R14 LT4 R13

Key

- Indicative Dismantling Works Area ("Works Area")
- Nuclear Site Licence Boundary ("The Site")
- Short term monitoring location
- Long term monitoring location
- Receptor

0 500 1,000 m

Scale at A3: 1:25,000

Decommissioning of Hunterston B Nuclear Power Station
Noise Survey Report

Figure 2.1 - Appendix A
Monitoring locations and noise sensitive receptor locations

October 2022

Appendix B
Long term measurement location details, short term measurement location photographs, short term measurement details

Location (ID/ Address/ Coordinates)	LT1, 47 Marine Parade, Millport, KA28 0EF. 55° 44' 56.3" N, 4° 54' 51.1" W			
Personnel (start/ end)	FM+HM / FM	**Relevant Guidance/ BS / ISO Standard**	**BS 7445** **BS 5228** **BS 4142**	
Purpose of Monitoring	**HNB Decom Baseline**			
SLM ID	01265451	**Calibrator (start) (Cal. ID/ Cal. Level)**	2052327	94 dB 1 kHz
Sample period, Dynamic Range, Weighting	15 min, Band Z, main A	**Calibrator (end) (Cal. ID/ Cal. Level)**	86009	93.7 dB 1 kHz
Filename	5102	**Memory Card ID**	SD32FQYDR	
Start Date	27/04/2022	**End Date**	05/04/2022	
Start Time	14:00	**End Time**	12:05	
Microphone Height	**1.5 m**	**Façade/ Freefield**	Freefield	
Photo taken identifying location with equipment installed?			yes	

Weather at start			**Weather at end**		
Wind speed + dir.	0	N	Wind speed + dir.	0	N
(make 3 wind speed measurements and average)	0 0	S	(make 3 wind speed measurements and average)	0 0	S
Precipitation	none		Precipitation	none	
Cloud cover (100%= 8 oktas)	80%		Cloud cover (100%: 8 oktas)	100%	
Temperature/ RH	11°		Temperature/ RH	11°	
Subjective description (weather) (fog/ visibility/ ground conds.)	cloudy, some sun, overcast, visibilty good, dry ground		Subjective description (weather) (fog/ visibility/ ground conds.)	cloudy, overcast, good visibility, damp ground	

Description of site (location of equipment, general surroundings, nature of ground between NSR and noise source (hard/ soft ground, topography, intervening features))

front lawn of property, 3.5 m from neasrest reflective surface/building façade, residential, next to body of water, faces main road of millport, lightly trafficked

Description of noise environment at start of survey (general observations on principal noise sources, including which sources are dominant, if baseline surveying for introduction of new source then consider the character of the existing sound environment compared to the character of the new source)

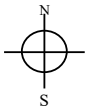
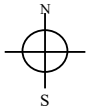
anthropogenic noise of Millport, light transient closeby RTN, chirp of birds, ride on lawnmower

Description of noise environment at end of survey (general observations on principal noise sources, including which sources are dominant, if baseline surveying for introduction of new source then consider the character of the existing sound environment compared to the character of the new source)

water lapping on shore, light RTN closeby, some chirp of birds]

Photographs of measurement location

Location (ID/ Address/ Coordinates)	LT2, Fencefoot Farm , Fairlie Moor, KA29 DEG, 55° 44' 13.7" N, 4° 51' 37.0" W			
Personnel (start/ end)	FM+HM / FM	**Relevant Guidance/ BS / ISO Standard**	**BS 7445** **BS 5228** **BS 4142**	
Purpose of Monitoring	**HNB Decom Baseline**			
SLM ID	01265413	**Calibrator (start) (Cal. ID/ Cal. Level)**	2052327	94 dB 1 kHz
Sample period, Dynamic Range, Weighting	15 min, Band Z, main A	**Calibrator (end) (Cal. ID/ Cal. Level)**	86009	93.9 dB 1 kHz
Filename	1302	**Memory Card ID**	SD BM2129753746G	
Start Date	27/04/2022	**End Date**	05/04/2022	
Start Time	15:45	**End Time**	12:56	
Microphone Height	**1.5 m**	**Façade/ Freefield**	Freefield	
Photo taken identifying location with equipment installed?			yes	

Weather at start			**Weather at end**		
Wind speed + dir.	0		Wind speed + dir.	0	
(make 3 wind speed measurements and average)	0		(make 3 wind speed measurements and average)	0	
	0			0	
Precipitation	none		Precipitation	none	
Cloud cover (100%= 8 oktas)	50%		Cloud cover (100%: 8 oktas)	90%	
Temperature/ RH	11°		Temperature/ RH	11°	
Subjective description (weather) (fog/ visibility/ ground conds.)	sunny with some clouds, visibilty VERY good, dry ground		Subjective description (weather) (fog/ visibility/ ground conds.)	cloudy, overcast, good visibility, damp ground	

Description of site (location of equipment, general surroundings, nature of ground between NSR and noise source (hard/ soft ground, topography, intervening features))

on grass next to car park, next to Farm, 40 m from Irvine Rd, cottages nearby, mostly farm land, road and trees

Description of noise environment at start of survey (general observations on principal noise sources, including which sources are dominant, if baseline surveying for introduction of new source then consider the character of the existing sound environment compared to the character of the new source)

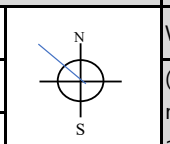
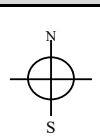
dominated by RTN of Irvine Rd, birds, wind interaction with trees, road busy 40-60 mph

Description of noise environment at end of survey (general observations on principal noise sources, including which sources are dominant, if baseline surveying for introduction of new source then consider the character of the existing sound environment compared to the character of the new source)

dominated by RTN, birds, no wind.

Photographs of measurement location

Location (ID/ Address/ Coordinates)	LT3, Hunterston Castle, KA23 9QG, 54° 43' 23" N, 4° 52' 43.0" W			
Personnel (start/ end)	FM+HM / FM	**Relevant Guidance/ BS / ISO Standard**	**BS 7445 BS 5228 BS 4142**	
Purpose of Monitoring	**HNB Decom Baseline**			
SLM ID	01265412	**Calibrator (start) (Cal. ID/ Cal. Level)**	BnK 4231m s/n 2052327	94 dB 1 kHz
Sample period, Dynamic Range, Weighting	15 min, Band Z, main A	**Calibrator (end) (Cal. ID/ Cal. Level)**	86009	93.9 dB 1 kHz
Filename	1202	**Memory Card ID**	BM1322222921G	
Start Date	27/04/2022	**End Date**	05/04/2022	
Start Time	16:30	**End Time**	13:12	
Microphone Height	**1.5 m**	**Façade/ Freefield**	Freefield	
Photo taken identifying location with equipment installed?			yes	

Weather at start			**Weather at end**		
Wind speed + dir.	1.3		Wind speed + dir.	0	
(make 3 wind speed measurements and average)	1.8		(make 3 wind speed measurements and average)	0	
	1			0	
Precipitation	none		Precipitation	none	
Cloud cover (100%= 8 oktas)	10%		Cloud cover (100%: 8 oktas)	100%	
Temperature/ RH	11°		Temperature/ RH	12°	
Subjective description (weather) (fog/ visibility/ ground conds.)	soft ground, very good visibility		Subjective description (weather) (fog/ visibility/ ground conds.)	damp ground, good visibility	

Description of site (location of equipment, general surroundings, nature of ground between NSR and noise source (hard/ soft ground, topography, intervening features))

castle grounds, couple of cottages, wide open field/lawn, large trees between NSR and source

Description of noise environment at start of survey (general observations on principal noise sources, including which sources are dominant, if baseline surveying for introduction of new source then consider the character of the existing sound environment compared to the character of the new source)

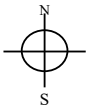
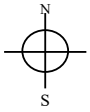
birds chirp, sheep, gardening activity, hedge trimming

Description of noise environment at end of survey (general observations on principal noise sources, including which sources are dominant, if baseline surveying for introduction of new source then consider the character of the existing sound environment compared to the character of the new source)

birds dominating, gardening, tannoy from Hunterston B, film crew setting up at castle (began 28/05/2022)

Photographs of measurement location

Location (ID/ Address/ Coordinates)	LT4, Bogriggs Cottage, Irvine Road, 55° 41' 47" N, 4° 52' 05.0" W			
Personnel (start/ end)	FM+HM / FM	**Relevant Guidance/ BS / ISO Standard**	**BS 7445** **BS 5228** **BS 4142**	
Purpose of Monitoring	**HNB Decom Baseline**			
SLM ID	duo 10510	**Calibrator (start) (Cal. ID/ Cal. Level)**	2052327	94 dB 1 kHz
Sample period, Dynamic Range, Weighting	15 min, Band Z, main A	**Calibrator (end) (Cal. ID/ Cal. Level)**	86009	93.9 dB 1 kHz
Filename	10510	**Memory Card ID**	SD BM2129753746G	
Start Date	27/04/2022	**End Date**	05/04/2022	
Start Time	17:34	**End Time**	14:20	
Microphone Height	**1.5 m**	**Façade/ Freefield**	Freefield	
Photo taken identifying location with equipment installed?			yes	

Weather at start			**Weather at end**		
Wind speed + dir.	0		Wind speed + dir.	0	
(make 3 wind speed measurements and average)	0 0		(make 3 wind speed measurements and average)	0 0	
Precipitation	none		Precipitation	none	
Cloud cover (100%= 8 oktas)	0%		Cloud cover (100%: 8 oktas)	100%	
Temperature/ RH	11°		Temperature/ RH	10°	
Subjective description (weather) (fog/ visibility/ ground conds.)	soft ground, very good visibilty, sunny		Subjective description (weather) (fog/ visibility/ ground conds.)	damp ground, good visibility	

Description of site (location of equipment, general surroundings, nature of ground between NSR and noise source (hard/ soft ground, topography, intervening features))

cottage on main road, garden/lawn, large field east of house

Description of noise environment at start of survey (general observations on principal noise sources, including which sources are dominant, if baseline surveying for introduction of new source then consider the character of the existing sound environment compared to the character of the new source)

High RTN, some birds chirping, NSR to source is soft ground, open area, some large sparse trees

Description of noise environment at end of survey (general observations on principal noise sources, including which sources are dominant, if baseline surveying for introduction of new source then consider the character of the existing sound environment compared to the character of the new source)

RTN dominating, bird chirping

Photographs of measurement location

Photographs of measurement location ST1

Photographs of measurement location ST2

Photographs of measurement location ST3

Photographs of measurement location ST4

Location	Period	Surveyor	Measurement No (File Name/ ID)	Start Date & Time	Duration (mm:ss)	Local Weather			Subjective Audibility* (0 – 4)				Sound Pressure Level, dB					No. of Pauses	Comments (Including reasons for pausing, audible noise sources etc.)
						Wind Speed, m/s	Wind Direction	Cloud, Oktas	Industry	Wind in flora	Road	Other	L_{Aeq}	L_{Amax}	L_{A10}	L_{A50}	L_{A90}		
ST1	D	FM	3602 0003	28/04/2022 14:21	60:00	1	SW	3	1	0	3	2	46	72	47	44	42	3	engine beating noise from south, paused for chatting, RTN dominant
ST1	D	HM	3403 0001	28/04/2022 11:05	60:00	0-1		6	1	0	2	3	44	61	47	43	39	5	Distant lawnmower, garndeing, birds in trees, constant distant traffic, paused for traffic in car park, leaf blower
ST1	D	HM	3403 0005	28/04/2022 17:10	60:00	0		3	0	0	3	3	42	59	44	41	38	7	birds and RTN constant - people active at measurment point (paused out)
ST1	N	HM	3402 0002	27/04/2022 23:16	15:00	4-6		0	0	4	2	0	42	59	45	39	38	10	noise dominated by wind in flora - high windspeeds
ST1	N	HM	3402 0004	28/04/2022 00:13	15:00	0-3		0	0	1	2	0	34	48	37	30	28	3	wind sutable for measurement - ambient traffic noise dominant
ST1	N	HM	3402 0006	28/04/2022 01:07	15:00	0-1		0	0	1	2	1	36	52	39	30	28	3	additional slight hum from unidentified source
ST2	D	FM	3602 0004	28/04/2022 15:33	60:00	0	SW	8	0	0	4	0	62	75	67	57	43	4	bird song dominant
ST2	D	HM	3403 0002	28/04/2022 12:28	60:00	0-1		7	0	0	3	2	61	76	65	54	43	10+	RTN dominant 20-40 mph when pausing, some brief period no passsing traffic, anthropogenic noise, gardening, people, paused for cars, idling at junction
ST2	D	HM	3403 0006	28/04/2022 18:17	60:00	0		0	0	0	3	2	57	77	62	50	41	5	birds and RTN constant + transient close passing cars
ST2	N	HM	3402 0003	27/04/2022 23:44	15:00	3-5		0	0	3	3	0	49	71	50	46	41	10	wind remianed high - reduced throughout the measurement - traffic close by transient noise
ST2	N	HM	3402 0005	28/04/2022 00:43	15:00	0-2		0	0	1	3	0	33	49	37	28	24	5	wind suitable for measurment - amient traffic dominant - close passing cars caused transient noise and close passing traffic/idling paused out
ST2	N	HM	3402 0007	28/04/2022 01:31	15:00	0-2		0	0	1	3	1	33	50	36	32	28	5	additional slight hum from unidentified source
ST3	D	FM	3602 0001	28/04/2022 11:11	60:00	0		2	0	0	2	2	46	66	51	38	30	3	bird song, paused reversing plant machinery, light RTN
ST3	D	FM	3602 0005	28/04/2022 16:54	60:00	0		3	0	0	0	1	43	64	46	34	28	1	RTN only prominent source, occasional bird chirping
ST3	D	HM	3403 0003	28/04/2022 14:04	60:00	0-1		6	2	0	1	2	37	61	40	33	28	8	dogs barking, birds chirping, distant RTN, reversing alarm, dump truck movement for nearby yard
ST3	N	FM	3601 0002	27/04/2022 23:16	15:00	1	NW	0	0	0	0	1	29	43	32	26	25	5	horse in adjacent field, beating/pulsating noise, low frequency
ST3	N	FM	3601 0004	28/04/2022 00:24	15:00	0		0	0	0	0	1	27	47	30	25	23	1	beating noise in low frequency range, plane/boat engine
ST3	N	FM	3601 0006	28/04/2022 01:26	15:00	1	NW	0	0	0	0	1	24	36	26	23	22	0	beating/engine drone
ST4	D	FM	3602 0002	28/04/2022 12:41	60:00	1		2	3	0	2	1	44	65	47	37	31	10	paused for some construction noise, RTN, birds, paused for dog walkers/digger
ST4	D	FM	3602 0006	28/04/2022 18:07	60:00	0		0	0	0	0	1	34	59	36	30	25	2	plane noise, bird song towards end of measurement
ST4	D	HM	3403 0004	28/04/2022 15:42	60:00	0-1		5	1	0	1	2	33	58	34	28	24	3	distant construction works, distant traffic, birds chiping
ST4	N	FM	3601 0003	27/04/2022 23:54	15:00	0		0	0	0	1	0	30	44	31	30	29	0	road traffic noise Irvine Road
ST4	N	FM	3601 0005	28/04/2022 00:55	15:00	0		0	0	0	0	1	30	42	31	30	29	0	fan turbine noise
ST4	N	FM	3601 0007	28/04/2022 01:53	15:00	1	NW	0	0	0	0	1	30	47	31	30	29	0	fan turbine noise

*Subjective Audibility:

0 = Inaudible

1 = Just audible

2 = Audible

3 = Significant Source

4 = Dominant

Appendix C
Calibration certificates

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 26 May 2020

Certificate Number: UCRT20/1449

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

B. Giles

Customer: Wood Group
St. Vincent Plaza (Floor 2)
319 St. Vincent Street
Glasgow
G2 5LP

The calibration interval for this instrument is 24 months / ~~years~~
Next calibration due before: 26 / 05 /20 22

Order No. 26004761

Description: Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	00175536
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	65638
Rion	Microphone	UC-59	13128
Rion	Calibrator	NC-74	34178103
	Calibrator adaptor type if applicable		NC-74-002

Performance Class: 1

Test Procedure: TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received 21 May 2020 ANV Job No. UKAS20/05266

Date Calibrated 26 May 2020

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	24 April 2018	UCRT18/1444	0653

CERTIFICATE OF CALIBRATION

Certificate Number	
UCRT20/1449	
UKAS Accredited Calibration Laboratory No. 0653	Page 2 of 2 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52	
SLM instruction manual ref / issue		11-03	
SLM instruction manual source		Manufacturer	
Internet download date if applicable		N/A	
Case corrections available		Yes	
Uncertainties of case corrections		Yes	
Source of case data		Manufacturer	
Wind screen corrections available		Yes	
Uncertainties of wind screen corrections		Yes	
Source of wind screen data		Manufacturer	
Mic pressure to free field corrections		Yes	
Uncertainties of Mic to F.F. corrections		Yes	
Source of Mic to F.F. corrections		Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002		Yes	
Specified or equivalent Calibrator		Specified	
Customer or Lab Calibrator		Customers Calibrator	
Calibrator adaptor type if applicable		NC-74-002	
Calibrator cal. date		22 May 2020	
Calibrator cert. number		UCRT20/1440	
Calibrator cal cert issued by		0653	
Calibrator SPL @ STP	94.03	dB	Calibration reference sound pressure level
Calibrator frequency	1001.91	Hz	Calibration check frequency
Reference level range	25 - 130	dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End			
Temperature	21.97	22.14	±	0.30	°C
Humidity	41.7	41.8	±	3.00	%RH
Ambient Pressure	102.58	102.58	±	0.03	kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.3	dB		Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±					0.10	dB

Self Generated Noise — This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	12.9	dB	UR	16.8	dB	UR	23.1	dB	UR
Uncertainty of the electrical self generated noise ±					0.12	dB			

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

……. END ……

Calibrated by: B. Giles R 1

Additional Comments The results on this certificate only relate to the items calibrated as identified above.
None

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 29 May 2020 **Certificate Number: UCRT20/1458**

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

K. Mistry

CUSTOMER	Wood Group St. Vincent Plaza (Floor 2) 319 St. Vincent Street Glasgow G2 5LP
ORDER No	26004789
Job No	UKAS20/05270
DATE OF RECEIPT	27 May 2020
PROCEDURE	Procedure TP 9 - Calibration of Filters

IDENTIFICATION	*Manufacturer*	*Model*	*Serial No*
Filters in sound level meter	Rion	NL-52	00175536

CALIBRATED ON	29 May 2020
PREVIOUS CALIBRATION	Calibrated on 24 April 2018 Certificate No. UCRT18/1445 issued by this laboratory.

The sound level meter was calibrated in accordance with the manufacturer's instructions, using an appropriate sound level calibrator, prior to measurements being carried out on the filters. The sound level meter has also undergone a full verification procedure, see certificate UCRT20/1449 issued by this laboratory. The manufacturer claims that the filters were designed in accordance with the Class 1 octave and Class 1 third octave requirements of IEC 61260:1995, and these tolerances are given with the results in this certificate. Base 10 test frequencies have been used throughout the filter calibration, in accordance with manufacturers' information.

Inter-band level accuracy test

The meter was set to the single measurement range and the 1 kHz octave filter was selected. A 1 kHz sinusoidal signal was then injected and adjusted to give a reading of 94.0 dB. Following this each filter band was selected in turn, the signal frequency was adjusted to the centre-frequency of the filter, and the sound level meter reading relative to that for the 1 kHz band was noted. A similar test was carried out for the Z setting using a 1 kHz signal.

These tests were then repeated for third octave filters, readjusting the signal level for the 1 kHz filter where necessary.

As the tolerance at the centre frequency in each band is ± 0.3 dB , it is expected (but not explicitly required in IEC 61260:1995), that the relative levels at each centre frequency shall lie within this spread. All bands tested met this expectation.

Filter shape test

Using the same measurement range as above, the 1 kHz octave filter was again selected. A sinusoidal signal at the centre frequency of 1 kHz was injected, and its level adjusted to give a reading of 135.0 dB. The frequency of the input signal was then changed to each of the values shown in the table of results in turn, and the new meter reading was noted. Two further octave bands (as shown) were then selected and tested in the same manner, with the signal level being set at the new centre frequency in each case.

The above tests were repeated for the 1 kHz and two other third octave bands (as shown).

All bands tested met the requirements of the standard, which are shown with the results.

Uncertainties

The laboratories expanded measurement uncertainties are estimated as ± 0.16 dB at the centre frequency & at other frequencies within the pass-band of the filter, and ± 0.20 dB for frequencies outside the pass-band. **The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.**

NOTES

1 The attenuation figures given in the table(s) of filter shapes refer to the meter reading at the given frequency relative to that at the centre frequency in question. The required value is denoted as Δ in the column showing attenuation limits.

2 Since the tests carried out cover only a limited subset of the content of IEC 61260:1995, the results obtained do not confer compliance with the full requirements of that standard, and are applicable only to those filter bands tested.

3 Any linearity errors which the sound level meter may exhibit are included in the filter errors shown in this certificate. Since the meter errors may vary with frequency, it cannot be assumed that they are the same as those given in certificate number UCRT20/1449

4 The following firmware was in use at the time of the testing:

Identification	Version
SLM	2.0

1/1 octave filters: Inter-band accuracy

Band (Hz)	Error, dB
4	N/A
8	N/A
16	0.1
31.5	0.1
63	0.1
125	0.0
250	0.0
500	0.0
1000	Ref
2000	0.0
4000	0.0
8000	0.0
16000	0.0
31500	N/A
Z @ 1 kHz	0.0

1/1 octave filters: Filter shape

1000 Hz band		125 Hz band		2000 Hz band		Attenuation
Freq, Hz	Atten, dB	Freq, Hz	Atten, dB	Freq, Hz	Atten, dB	limits, dB
63.096	105.5	7.943	88.2	125.895	107.4	$70.0 \le \Delta \le \infty$
125.893	101.7	15.849	88.7	251.193	101.7	$61.0 \le \Delta \le \infty$
251.189	82.7	31.622	79.4	501.197	83.0	$42.0 \le \Delta \le \infty$
501.187	39.8	63.094	39.8	1000.02	39.8	$17.5 \le \Delta \le \infty$
707.946	3.2	89.123	3.2	1412.56	3.2	$-0.3 \le \Delta \le 5.0$
771.792	0.1	97.161	0.1	1539.96	0.1	$-0.3 \le \Delta \le 1.3$
841.395	0.0	105.923	-0.1	1678.84	0.0	$-0.3 \le \Delta \le 0.6$
917.276	0.0	115.476	0.0	1830.24	0.0	$-0.3 \le \Delta \le 0.4$
1000.00	Ref	125.890	Ref	1995.30	Ref	$-0.3 \le \Delta \le 0.3$
1090.18	0.0	137.243	0.0	2175.25	0.0	$-0.3 \le \Delta \le 0.4$
1188.50	0.0	149.621	-0.1	2371.42	0.0	$-0.3 \le \Delta \le 0.6$
1295.69	0.1	163.114	0.1	2585.28	0.1	$-0.3 \le \Delta \le 1.3$
1412.54	3.2	177.824	3.2	2818.44	3.3	$-0.3 \le \Delta \le 5.0$
1995.26	40.6	251.184	40.7	3981.15	40.6	$17.5 \le \Delta \le \infty$
3981.07	109.6	501.177	>110.0	7943.43	106.7	$42.0 \le \Delta \le \infty$
7943.28	106.5	999.980	>110.0	15849.2	106.8	$61.0 \le \Delta \le \infty$
15848.9	109.0	1995.22	>110.0	31623.4	106.9	$70.0 \le \Delta \le \infty$

1/3 octave filters: Inter-band accuracy

Band (Hz)	Error, dB
4	N/A
8	N/A
16	0.1
31.5	0.1
63	0.1
125	0.0
250	0.0
500	0.0
1000	Ref
2000	0.0
4000	0.0
8000	0.0
16000	0.0
31500	N/A
Z @ 1 kHz	0.0

Band (Hz)	Error, dB
5	N/A
10	N/A
20	0.1
40	0.0
80	0.0
160	0.0
315	0.0
630	0.0
1250	0.0
2500	0.0
5000	0.0
10000	0.0
20000	0.0

Band (Hz)	Error, dB
6.3	N/A
12.5	0.1
25	0.1
50	0.0
100	0.0
200	0.0
400	0.0
800	0.0
1600	0.0
3150	0.0
6300	0.0
12500	0.0
25000	N/A

1/3 octave filters: Filter shape

1000 Hz band	
Freq, Hz	Atten, dB
185.460	82.3
327.480	65.5
531.430	47.2
772.570	22.4
891.260	3.6
919.580	0.7
947.190	0.0
974.020	0.0
1000.00	Ref
1026.67	0.0
1055.75	0.0
1087.46	0.8
1122.01	3.8
1294.37	22.6
1881.73	47.6
3053.65	>110.0
5391.95	>110.0

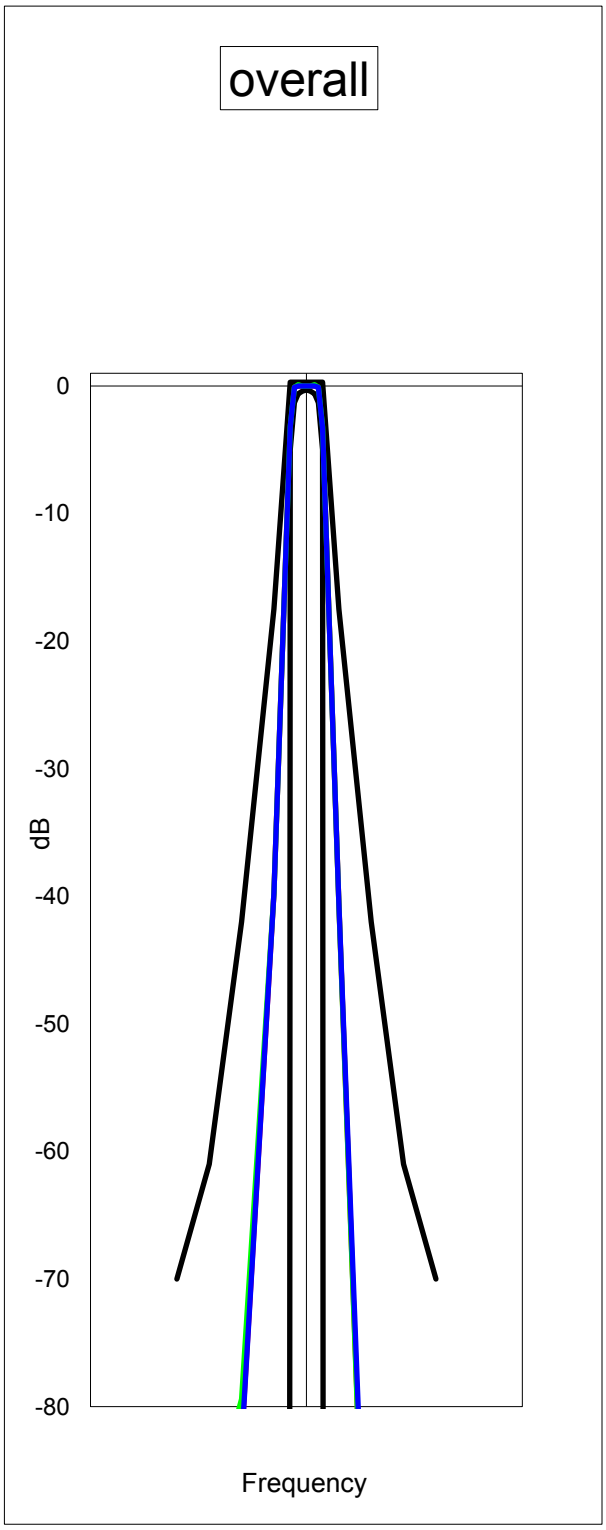
100 Hz band	
Freq, Hz	Atten, dB
18.546	81.4
32.748	65.4
53.143	47.1
77.257	22.3
89.126	3.6
91.958	0.8
94.719	0.1
97.402	0.0
100.000	Ref
102.667	0.0
105.575	0.1
108.746	0.8
112.201	3.9
129.437	22.6
188.173	47.4
305.365	68.3
539.195	>110.0

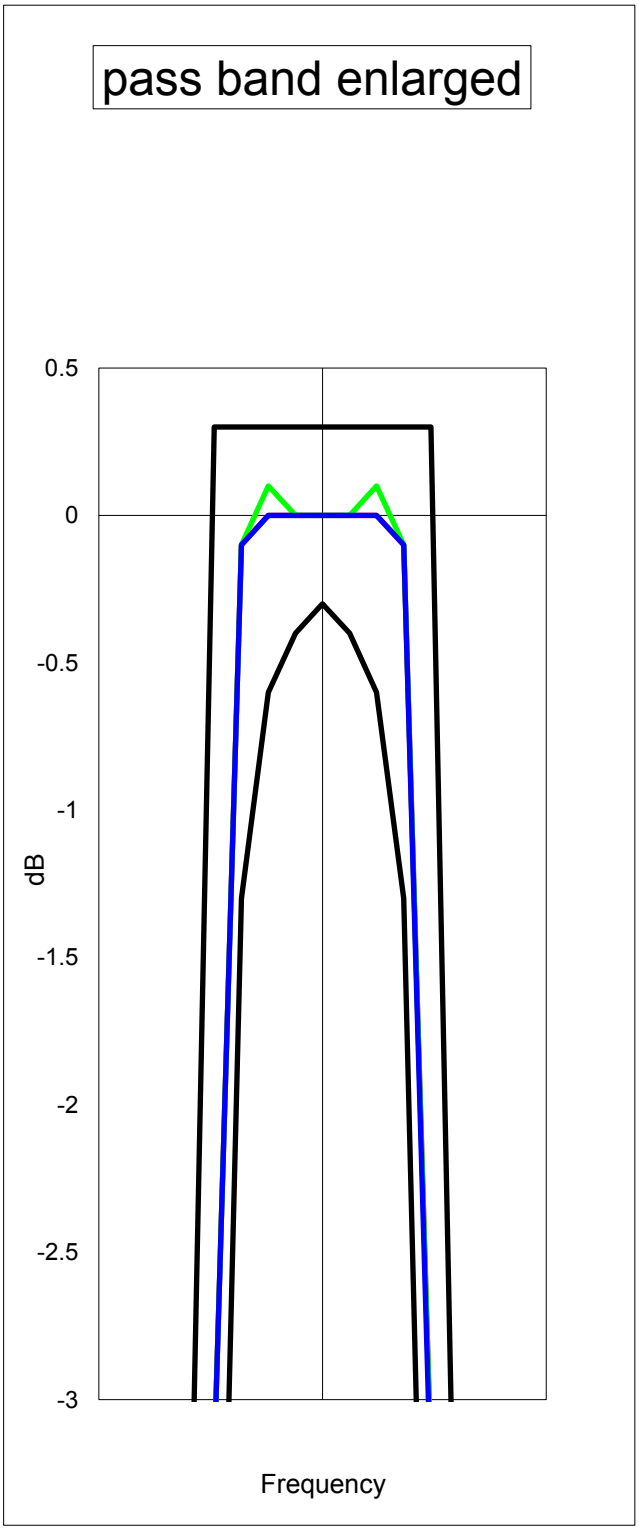
2500 Hz band	
Freq, Hz	Atten, dB
465.857	82.4
822.597	65.6
1334.90	47.3
1940.62	22.4
2238.76	3.8
2309.89	0.8
2379.25	0.1
2446.64	0.1
2511.90	Ref
2578.89	0.0
2651.94	0.1
2731.59	0.9
2818.38	3.9
3251.33	22.6
4726.72	48.5
7670.46	>110.0
13544.0	>110.0

Attenuation limits, dB
$70.0 \le \Delta \le \infty$
$61.0 \le \Delta \le \infty$
$42.0 \le \Delta \le \infty$
$17.5 \le \Delta \le \infty$
$-0.3 \le \Delta \le 5.0$
$-0.3 \le \Delta \le 1.3$
$-0.3 \le \Delta \le 0.6$
$-0.3 \le \Delta \le 0.4$
$-0.3 \le \Delta \le 0.3$
$-0.3 \le \Delta \le 0.4$
$-0.3 \le \Delta \le 0.6$
$-0.3 \le \Delta \le 1.3$
$-0.3 \le \Delta \le 5.0$
$17.5 \le \Delta \le \infty$
$42.0 \le \Delta \le \infty$
$61.0 \le \Delta \le \infty$
$70.0 \le \Delta \le \infty$

OCTAVE FILTERS

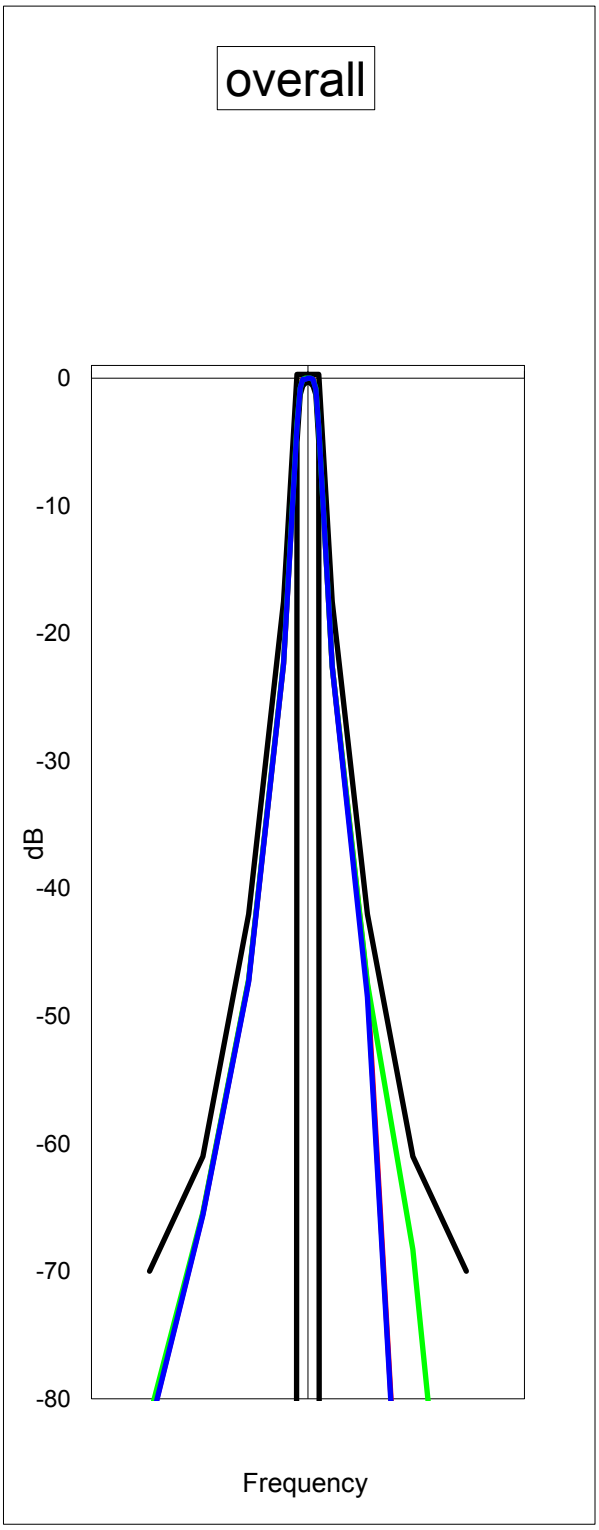
black IEC 61260 limits green 125 Hz band
red 1000 Hz band blue 2000 Hz band

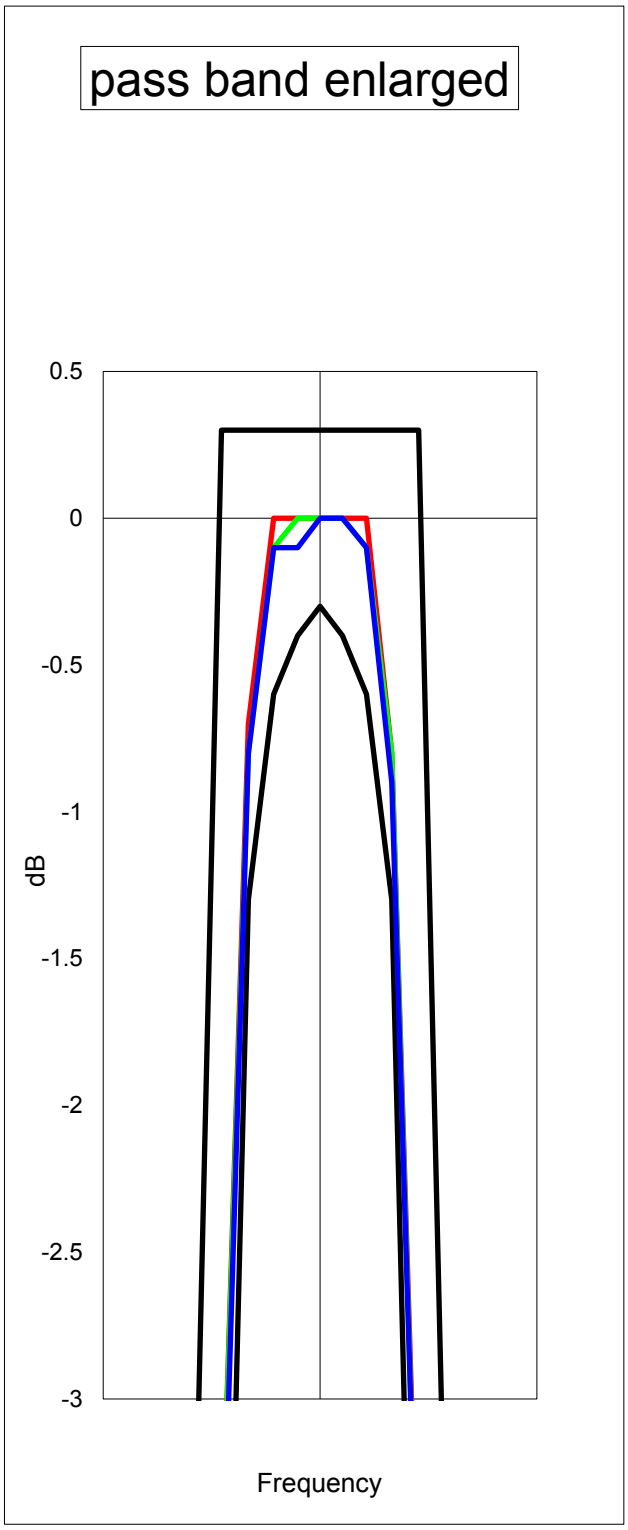




THIRD OCTAVE FILTERS

black	IEC 61260 limits	green	100 Hz band
red	1000 Hz band	blue	2500 Hz band





END

R 2

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 22 May 2020 **Certificate Number: UCRT20/1448**

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

B. Giles

Customer: Wood Group
St. Vincent Plaza (Floor 2)
319 St. Vincent Street
Glasgow
G2 5LP

The calibration interval for this instrument is 24 months / ~~years~~
Next calibration due before:
22 / 05 /20 22

Order No. 26004761
Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	01265413
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	65415
Rion	Microphone	UC-59	10634
Rion	Calibrator	NC-74	34178103
	Calibrator adaptor type if applicable		NC-74-002

Performance Class 1
Test Procedure TP 2.SLM 61672-3 TPS-49
Procedures from IEC 61672-3:2006 were used to perform the periodic tests.
Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02
If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003
Date Received 21 May 2020 ANV Job No. UKAS20/05266
Date Calibrated 22 May 2020

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	05 March 2018	UCRT18/1252	0653

CERTIFICATE OF CALIBRATION

Certificate Number	
UCRT20/1448	
UKAS Accredited Calibration Laboratory No. 0653	Page 2 of 2 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52	
SLM instruction manual ref / issue		11-03	
SLM instruction manual source		Manufacturer	
Internet download date if applicable		N/A	
Case corrections available		Yes	
Uncertainties of case corrections		Yes	
Source of case data		Manufacturer	
Wind screen corrections available		Yes	
Uncertainties of wind screen corrections		Yes	
Source of wind screen data		Manufacturer	
Mic pressure to free field corrections		Yes	
Uncertainties of Mic to F.F. corrections		Yes	
Source of Mic to F.F. corrections		Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002		Yes	
Specified or equivalent Calibrator		Specified	
Customer or Lab Calibrator		Customers Calibrator	
Calibrator adaptor type if applicable		NC-74-002	
Calibrator cal. date		22 May 2020	
Calibrator cert. number		UCRT20/1440	
Calibrator cal cert issued by		0653	
Calibrator SPL @ STP	94.03	dB	Calibration reference sound pressure level
Calibrator frequency	1001.91	Hz	Calibration check frequency
Reference level range	25 - 130	dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End			
Temperature	23.41	23.53	±	0.30	°C
Humidity	38.9	38.5	±	3.00	%RH
Ambient Pressure	100.45	100.46	±	0.03	kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.6	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise — This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	11.5	dB	UR	15.7	dB	UR	20.9	dB	UR
Uncertainty of the electrical self generated noise ±						0.12		dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

……. END ……

Calibrated by: B. Giles R 1

Additional Comments The results on this certificate only relate to the items calibrated as identified above.
None

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 29 May 2020

Certificate Number: UCRT20/1454

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

K. Mistry

CUSTOMER	Wood Group St. Vincent Plaza (Floor 2) 319 St. Vincent Street Glasgow G2 5LP
ORDER No	26004789
Job No	UKAS20/05270
DATE OF RECEIPT	27 May 2020
PROCEDURE	Procedure TP 9 - Calibration of Filters

IDENTIFICATION	*Manufacturer*	*Model*	*Serial No*
Filters in sound level meter	Rion	NL-52	01265413

CALIBRATED ON 29 May 2020

The sound level meter was calibrated in accordance with the manufacturer's instructions, using an appropriate sound level calibrator, prior to measurements being carried out on the filters. The sound level meter has also undergone a full verification procedure, see certificate UCRT20/1448 issued by this laboratory. The manufacturer claims that the filters were designed in accordance with the Class 1 octave and Class 1 third octave requirements of IEC 61260:1995, and these tolerances are given with the results in this certificate. Base 10 test frequencies have been used throughout the filter calibration, in accordance with manufacturers' information.

Inter-band level accuracy test

The meter was set to the single measurement range and the 1 kHz octave filter was selected. A 1 kHz sinusoidal signal was then injected and adjusted to give a reading of 94.0 dB. Following this each filter band was selected in turn, the signal frequency was adjusted to the centre-frequency of the filter, and the sound level meter reading relative to that for the 1 kHz band was noted. A similar test was carried out for the Z setting using a 1 kHz signal.

These tests were then repeated for third octave filters, readjusting the signal level for the 1 kHz filter where necessary.

As the tolerance at the centre frequency in each band is ± 0.3 dB , it is expected (but not explicitly required in IEC 61260:1995), that the relative levels at each centre frequency shall lie within this spread. All bands tested met this expectation.

Filter shape test

Using the same measurement range as above, the 1 kHz octave filter was again selected. A sinusoidal signal at the centre frequency of 1 kHz was injected, and its level adjusted to give a reading of 135.0 dB. The frequency of the input signal was then changed to each of the values shown in the table of results in turn, and the new meter reading was noted. Two further octave bands (as shown) were then selected and tested in the same manner, with the signal level being set at the new centre frequency in each case.

The above tests were repeated for the 1 kHz and two other third octave bands (as shown).

All bands tested met the requirements of the standard, which are shown with the results.

Uncertainties

The laboratories expanded measurement uncertainties are estimated as ± 0.16 dB at the centre frequency & at other frequencies within the pass-band of the filter, and ± 0.20 dB for frequencies outside the pass-band. **The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.**

NOTES

1 The attenuation figures given in the table(s) of filter shapes refer to the meter reading at the given frequency relative to that at the centre frequency in question. The required value is denoted as Δ in the column showing attenuation limits.

2 Since the tests carried out cover only a limited subset of the content of IEC 61260:1995, the results obtained do not confer compliance with the full requirements of that standard, and are applicable only to those filter bands tested.

3 Any linearity errors which the sound level meter may exhibit are included in the filter errors shown in this certificate. Since the meter errors may vary with frequency, it cannot be assumed that they are the same as those given in certificate number UCRT20/1448

4 The following firmware was in use at the time of the testing:

Identification	Version
SLM	2.0

1/1 octave filters: Inter-band accuracy

Band (Hz)	Error, dB
4	N/A
8	N/A
16	0.1
31.5	0.1
63	0.0
125	0.0
250	0.0
500	0.0
1000	Ref
2000	0.0
4000	0.0
8000	0.0
16000	0.0
31500	N/A
Z @ 1 kHz	0.0

1/1 octave filters: Filter shape

1000 Hz band		125 Hz band		2000 Hz band		Attenuation
Freq, Hz	Atten, dB	Freq, Hz	Atten, dB	Freq, Hz	Atten, dB	limits, dB
63.096	105.3	7.943	88.1	125.895	106.6	$70.0 \le \Delta \le \infty$
125.893	101.5	15.849	88.6	251.193	102.3	$61.0 \le \Delta \le \infty$
251.189	81.8	31.622	78.6	501.197	82.0	$42.0 \le \Delta \le \infty$
501.187	39.8	63.094	39.9	1000.02	39.8	$17.5 \le \Delta \le \infty$
707.946	3.3	89.123	3.3	1412.56	3.2	$-0.3 \le \Delta \le 5.0$
771.792	0.2	97.161	0.2	1539.96	0.1	$-0.3 \le \Delta \le 1.3$
841.395	0.0	105.923	0.0	1678.84	0.0	$-0.3 \le \Delta \le 0.6$
917.276	0.0	115.476	0.0	1830.24	0.0	$-0.3 \le \Delta \le 0.4$
1000.00	Ref	125.890	Ref	1995.30	Ref	$-0.3 \le \Delta \le 0.3$
1090.18	0.0	137.243	0.0	2175.25	0.0	$-0.3 \le \Delta \le 0.4$
1188.50	0.0	149.621	0.0	2371.42	0.0	$-0.3 \le \Delta \le 0.6$
1295.69	0.2	163.114	0.1	2585.28	0.1	$-0.3 \le \Delta \le 1.3$
1412.54	3.3	177.824	3.3	2818.44	3.3	$-0.3 \le \Delta \le 5.0$
1995.26	40.7	251.184	40.7	3981.15	40.7	$17.5 \le \Delta \le \infty$
3981.07	>110.0	501.177	105.1	7943.43	108.0	$42.0 \le \Delta \le \infty$
7943.28	>110.0	999.980	>110.0	15849.2	107.8	$61.0 \le \Delta \le \infty$
15848.9	109.3	1995.22	>110.0	31623.4	106.8	$70.0 \le \Delta \le \infty$

1/3 octave filters: Inter-band accuracy

Band (Hz)	Error, dB
4	N/A
8	N/A
16	0.1
31.5	0.0
63	0.0
125	0.0
250	0.0
500	0.0
1000	Ref
2000	0.0
4000	0.0
8000	-0.1
16000	0.0
31500	N/A
Z @ 1 kHz	0.0

Band (Hz)	Error, dB
5	N/A
10	N/A
20	0.1
40	0.0
80	0.0
160	0.0
315	0.0
630	0.0
1250	0.0
2500	-0.1
5000	0.0
10000	0.0
20000	0.0

Band (Hz)	Error, dB
6.3	N/A
12.5	0.1
25	0.0
50	0.0
100	0.0
200	0.0
400	0.0
800	0.0
1600	0.0
3150	0.0
6300	-0.1
12500	-0.1
25000	N/A

1/3 octave filters: Filter shape

1000 Hz band	
Freq, Hz	Atten, dB
185.460	82.3
327.480	65.5
531.430	47.2
772.570	22.4
891.260	3.6
919.580	0.8
947.190	0.1
974.020	0.0
1000.00	Ref
1026.67	0.0
1055.75	0.1
1087.46	0.9
1122.01	3.8
1294.37	22.6
1881.73	47.6
3053.65	>110.0
5391.95	>110.0

100 Hz band	
Freq, Hz	Atten, dB
18.546	81.3
32.748	65.4
53.143	47.2
77.257	22.4
89.126	3.6
91.958	0.8
94.719	0.1
97.402	0.0
100.000	Ref
102.667	0.0
105.575	0.1
108.746	0.9
112.201	3.9
129.437	22.7
188.173	47.4
305.365	68.3
539.195	>110.0

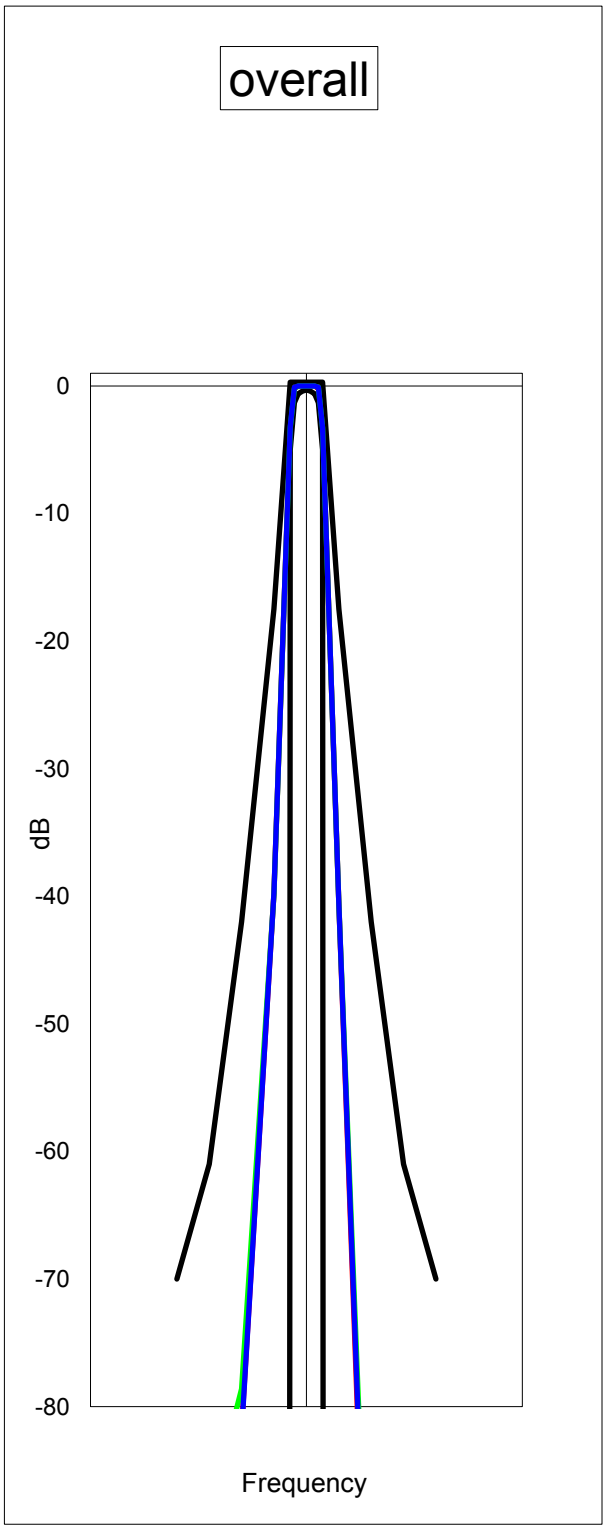
2500 Hz band	
Freq, Hz	Atten, dB
465.857	82.4
822.597	65.5
1334.90	47.2
1940.62	22.3
2238.76	3.5
2309.89	0.7
2379.25	0.0
2446.64	0.0
2511.90	Ref
2578.89	0.0
2651.94	0.0
2731.59	0.8
2818.38	3.8
3251.33	22.5
4726.72	48.5
7670.46	>110.0
13544.0	>110.0

Attenuation limits, dB
$70.0 \le \Delta \le \infty$
$61.0 \le \Delta \le \infty$
$42.0 \le \Delta \le \infty$
$17.5 \le \Delta \le \infty$
$-0.3 \le \Delta \le 5.0$
$-0.3 \le \Delta \le 1.3$
$-0.3 \le \Delta \le 0.6$
$-0.3 \le \Delta \le 0.4$
$-0.3 \le \Delta \le 0.3$
$-0.3 \le \Delta \le 0.4$
$-0.3 \le \Delta \le 0.6$
$-0.3 \le \Delta \le 1.3$
$-0.3 \le \Delta \le 5.0$
$17.5 \le \Delta \le \infty$
$42.0 \le \Delta \le \infty$
$61.0 \le \Delta \le \infty$
$70.0 \le \Delta \le \infty$

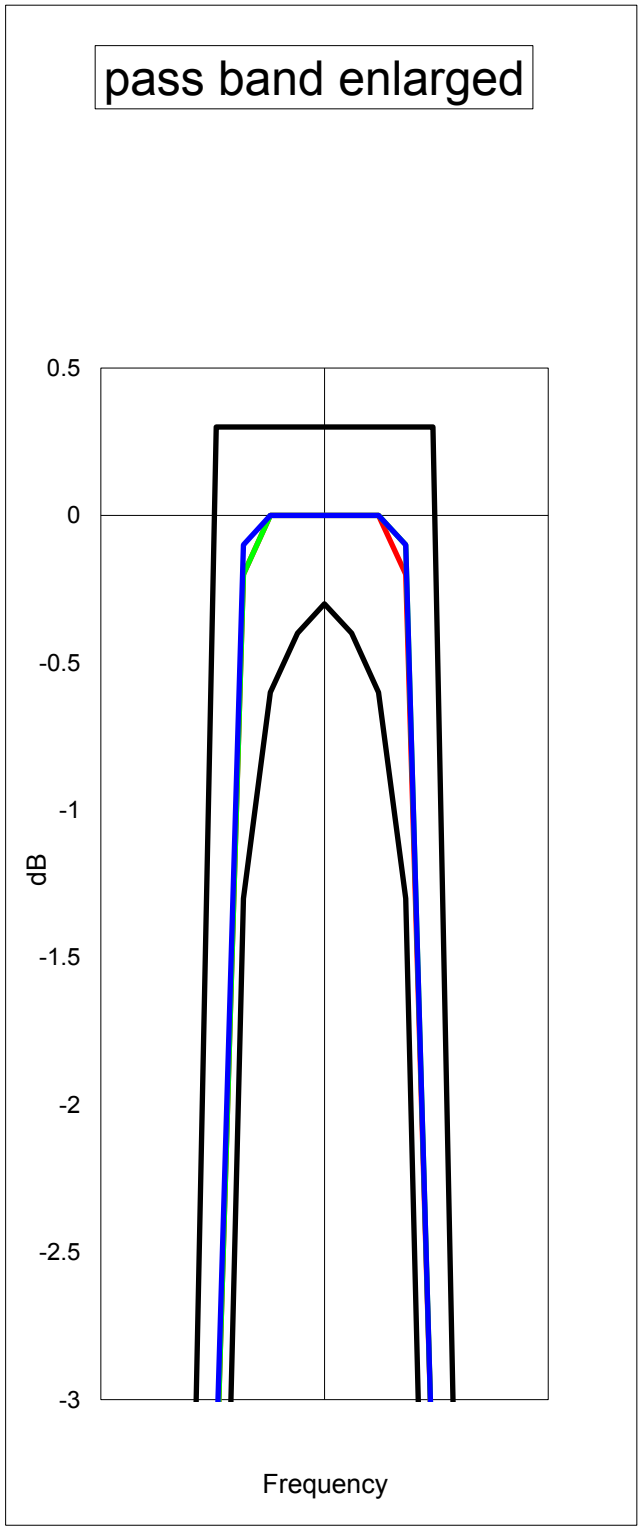
OCTAVE FILTERS

black	IEC 61260 limits	green	125 Hz band
red	1000 Hz band	blue	2000 Hz band

overall

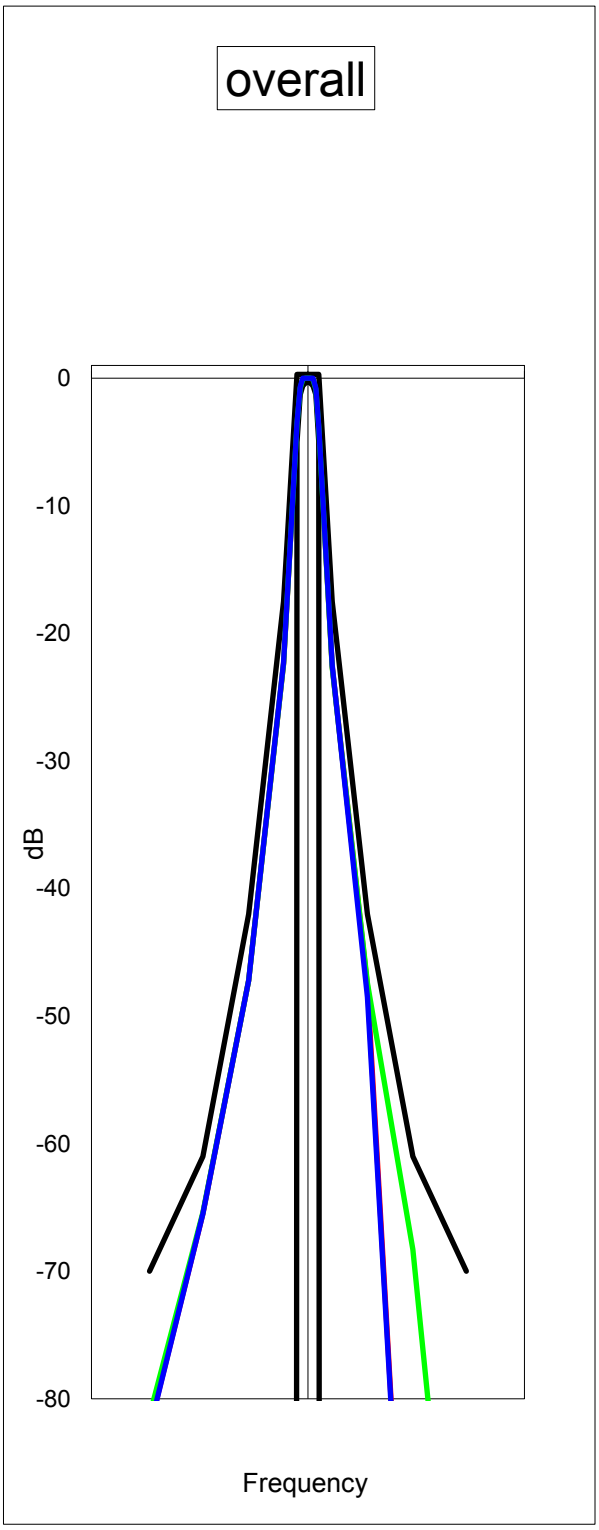


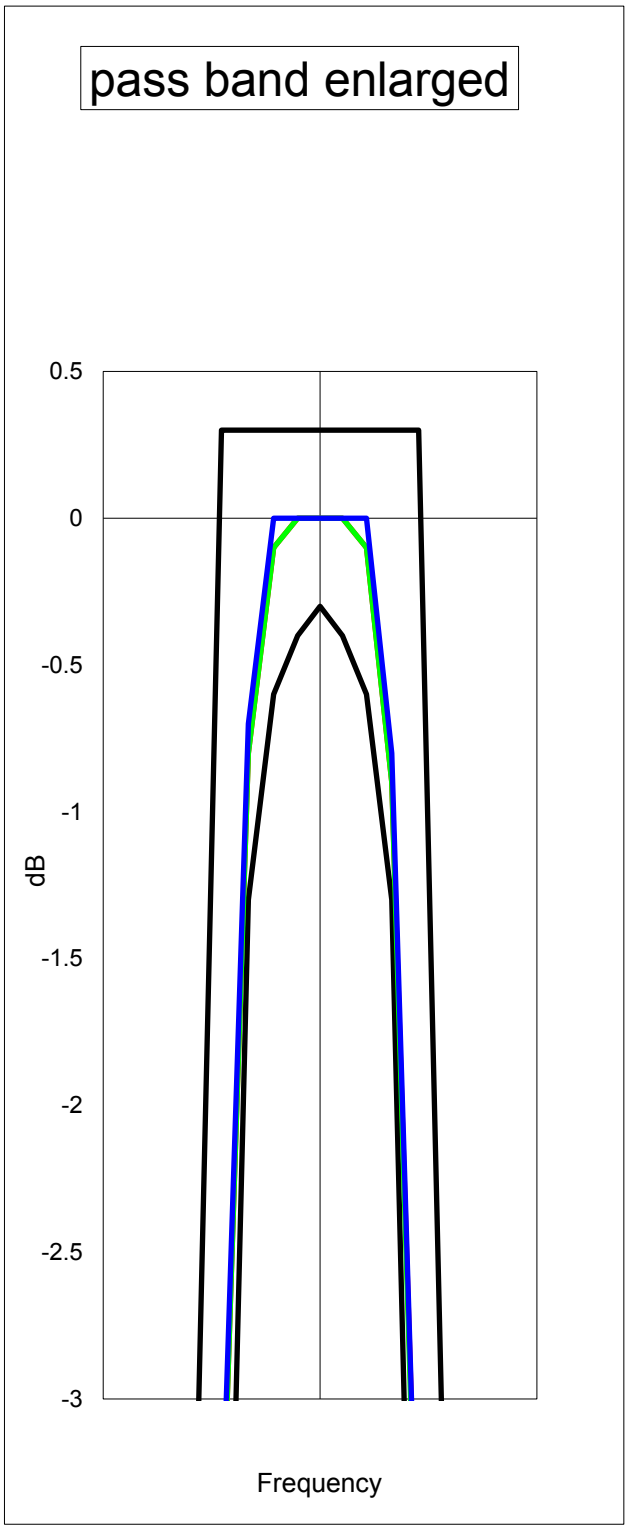
pass band enlarged



THIRD OCTAVE FILTERS

black	IEC 61260 limits	green	100 Hz band
red	1000 Hz band	blue	2500 Hz band





END

R 2

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 26 May 2020 **Certificate Number: UCRT20/1450**

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

B. Giles

Customer: Wood Group
St. Vincent Plaza (Floor 2)
319 St. Vincent Street
Glasgow
G2 5LP

The calibration interval for this instrument is 24 months / ~~years~~
Next calibration due before: 23 / 05 /2022

Order No. 26004761
Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	01265451
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	65453
Rion	Microphone	UC-59	10677
Rion	Calibrator	NC-74	34178103
	Calibrator adaptor type if applicable		NC-74-002

Performance Class 1
Test Procedure TP 2.SLM 61672-3 TPS-49
Procedures from IEC 61672-3:2006 were used to perform the periodic tests.
Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02
If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003
Date Received 21 May 2020 ANV Job No. UKAS20/05266
Date Calibrated 26 May 2020

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	05 March 2018	UCRT18/1250	0653

CERTIFICATE OF CALIBRATION

Certificate Number	
UCRT20/1450	
UKAS Accredited Calibration Laboratory No. 0653	Page 2 of 2 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52	
SLM instruction manual ref / issue		11-03	
SLM instruction manual source		Manufacturer	
Internet download date if applicable		N/A	
Case corrections available		Yes	
Uncertainties of case corrections		Yes	
Source of case data		Manufacturer	
Wind screen corrections available		Yes	
Uncertainties of wind screen corrections		Yes	
Source of wind screen data		Manufacturer	
Mic pressure to free field corrections		Yes	
Uncertainties of Mic to F.F. corrections		Yes	
Source of Mic to F.F. corrections		Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002		Yes	
Specified or equivalent Calibrator		Specified	
Customer or Lab Calibrator		Customers Calibrator	
Calibrator adaptor type if applicable		NC-74-002	
Calibrator cal. date		22 May 2020	
Calibrator cert. number		UCRT20/1440	
Calibrator cal cert issued by		0653	
Calibrator SPL @ STP		94.03 dB	Calibration reference sound pressure level
Calibrator frequency		1001.91 Hz	Calibration check frequency
Reference level range		25 - 130 dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	22.10	22.12	± 0.30 °C
Humidity	41.5	40.7	± 3.00 %RH
Ambient Pressure	102.58	102.57	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.2 dB		Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise — This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	11.7	dB	UR	15.5	dB	UR	21.4	dB	UR
Uncertainty of the electrical self generated noise ±						0.12		dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

……. END ……

Calibrated by: B. Giles R 1

Additional Comments The results on this certificate only relate to the items calibrated as identified above.
None

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 29 May 2020

Certificate Number: UCRT20/1457

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

K. Mistry

CUSTOMER

Wood Group
St. Vincent Plaza (Floor 2)
319 St. Vincent Street
Glasgow
G2 5LP

ORDER No 26004789 Job No UKAS20/05270

DATE OF RECEIPT 27 May 2020

PROCEDURE Procedure TP 9 - Calibration of Filters

IDENTIFICATION	*Manufacturer*	*Model*	*Serial No*
Filters in sound level meter	Rion	NL-52	01265451

CALIBRATED ON 29 May 2020

The sound level meter was calibrated in accordance with the manufacturer's instructions, using an appropriate sound level calibrator, prior to measurements being carried out on the filters. The sound level meter has also undergone a full verification procedure, see certificate UCRT20/1450 issued by this laboratory. The manufacturer claims that the filters were designed in accordance with the Class 1 octave and Class 1 third octave requirements of IEC 61260:1995, and these tolerances are given with the results in this certificate. Base 10 test frequencies have been used throughout the filter calibration, in accordance with manufacturers' information.

Inter-band level accuracy test

The meter was set to the single measurement range and the 1 kHz octave filter was selected. A 1 kHz sinusoidal signal was then injected and adjusted to give a reading of 94.0 dB. Following this each filter band was selected in turn, the signal frequency was adjusted to the centre-frequency of the filter, and the sound level meter reading relative to that for the 1 kHz band was noted. A similar test was carried out for the Z setting using a 1 kHz signal.

These tests were then repeated for third octave filters, readjusting the signal level for the 1 kHz filter where necessary.

As the tolerance at the centre frequency in each band is ± 0.3 dB , it is expected (but not explicitly required in IEC 61260:1995), that the relative levels at each centre frequency shall lie within this spread. All bands tested met this expectation.

Filter shape test

Using the same measurement range as above, the 1 kHz octave filter was again selected. A sinusoidal signal at the centre frequency of 1 kHz was injected, and its level adjusted to give a reading of 135.0 dB. The frequency of the input signal was then changed to each of the values shown in the table of results in turn, and the new meter reading was noted. Two further octave bands (as shown) were then selected and tested in the same manner, with the signal level being set at the new centre frequency in each case.

The above tests were repeated for the 1 kHz and two other third octave bands (as shown).

All bands tested met the requirements of the standard, which are shown with the results.

Uncertainties

The laboratories expanded measurement uncertainties are estimated as ± 0.16 dB at the centre frequency & at other frequencies within the pass-band of the filter, and ± 0.20 dB for frequencies outside the pass-band. **The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.**

NOTES

1 The attenuation figures given in the table(s) of filter shapes refer to the meter reading at the given frequency relative to that at the centre frequency in question. The required value is denoted as Δ in the column showing attenuation limits.

2 Since the tests carried out cover only a limited subset of the content of IEC 61260:1995, the results obtained do not confer compliance with the full requirements of that standard, and are applicable only to those filter bands tested.

3 Any linearity errors which the sound level meter may exhibit are included in the filter errors shown in this certificate. Since the meter errors may vary with frequency, it cannot be assumed that they are the same as those given in certificate number UCRT20/1450

4 The following firmware was in use at the time of the testing:

Identification	Version
SLM	2.0

1/1 octave filters: Inter-band accuracy

Band (Hz)	Error, dB
4	N/A
8	N/A
16	0.2
31.5	0.1
63	0.0
125	0.0
250	0.0
500	0.0
1000	Ref
2000	0.0
4000	0.0
8000	0.0
16000	0.0
31500	N/A
Z @ 1 kHz	0.0

1/1 octave filters: Filter shape

1000 Hz band		125 Hz band		2000 Hz band		Attenuation
Freq, Hz	Atten, dB	Freq, Hz	Atten, dB	Freq, Hz	Atten, dB	limits, dB
63.096	105.3	7.943	87.7	125.895	106.9	$70.0 \le \Delta \le \infty$
125.893	102.3	15.849	89.3	251.193	102.4	$61.0 \le \Delta \le \infty$
251.189	82.0	31.622	79.8	501.197	82.3	$42.0 \le \Delta \le \infty$
501.187	39.8	63.094	39.8	1000.02	39.8	$17.5 \le \Delta \le \infty$
707.946	3.2	89.123	3.2	1412.56	3.2	$-0.3 \le \Delta \le 5.0$
771.792	0.1	97.161	0.1	1539.96	0.1	$-0.3 \le \Delta \le 1.3$
841.395	0.0	105.923	-0.1	1678.84	0.0	$-0.3 \le \Delta \le 0.6$
917.276	0.0	115.476	0.0	1830.24	0.0	$-0.3 \le \Delta \le 0.4$
1000.00	Ref	125.890	Ref	1995.30	Ref	$-0.3 \le \Delta \le 0.3$
1090.18	0.0	137.243	0.0	2175.25	0.0	$-0.3 \le \Delta \le 0.4$
1188.50	0.0	149.621	0.0	2371.42	0.0	$-0.3 \le \Delta \le 0.6$
1295.69	0.1	163.114	0.1	2585.28	0.1	$-0.3 \le \Delta \le 1.3$
1412.54	3.2	177.824	3.2	2818.44	3.3	$-0.3 \le \Delta \le 5.0$
1995.26	40.7	251.184	40.7	3981.15	40.7	$17.5 \le \Delta \le \infty$
3981.07	110.0	501.177	>110.0	7943.43	107.7	$42.0 \le \Delta \le \infty$
7943.28	109.8	999.980	>110.0	15849.2	107.3	$61.0 \le \Delta \le \infty$
15848.9	108.8	1995.22	>110.0	31623.4	107.3	$70.0 \le \Delta \le \infty$

1/3 octave filters: Inter-band accuracy

Band (Hz)	Error, dB
4	N/A
8	N/A
16	0.2
31.5	0.1
63	0.0
125	0.0
250	0.0
500	0.0
1000	Ref
2000	0.0
4000	0.0
8000	0.0
16000	0.0
31500	N/A
Z @ 1 kHz	0.0

Band (Hz)	Error, dB
5	N/A
10	N/A
20	0.1
40	0.1
80	0.0
160	0.0
315	0.0
630	0.0
1250	0.0
2500	0.0
5000	0.0
10000	0.0
20000	0.0

Band (Hz)	Error, dB
6.3	N/A
12.5	0.2
25	0.1
50	0.1
100	0.0
200	0.0
400	0.0
800	0.0
1600	0.0
3150	0.0
6300	0.0
12500	0.0
25000	N/A

1/3 octave filters: Filter shape

1000 Hz band	
Freq, Hz	Atten, dB
185.460	82.3
327.480	65.5
531.430	47.2
772.570	22.4
891.260	3.6
919.580	0.7
947.190	0.0
974.020	0.0
1000.00	Ref
1026.67	0.0
1055.75	0.0
1087.46	0.8
1122.01	3.8
1294.37	22.6
1881.73	47.6
3053.65	>110.0
5391.95	>110.0

100 Hz band	
Freq, Hz	Atten, dB
18.546	81.1
32.748	65.4
53.143	47.1
77.257	22.4
89.126	3.6
91.958	0.7
94.719	0.1
97.402	0.0
100.000	Ref
102.667	0.0
105.575	0.1
108.746	0.9
112.201	3.9
129.437	22.6
188.173	47.4
305.365	68.3
539.195	>110.0

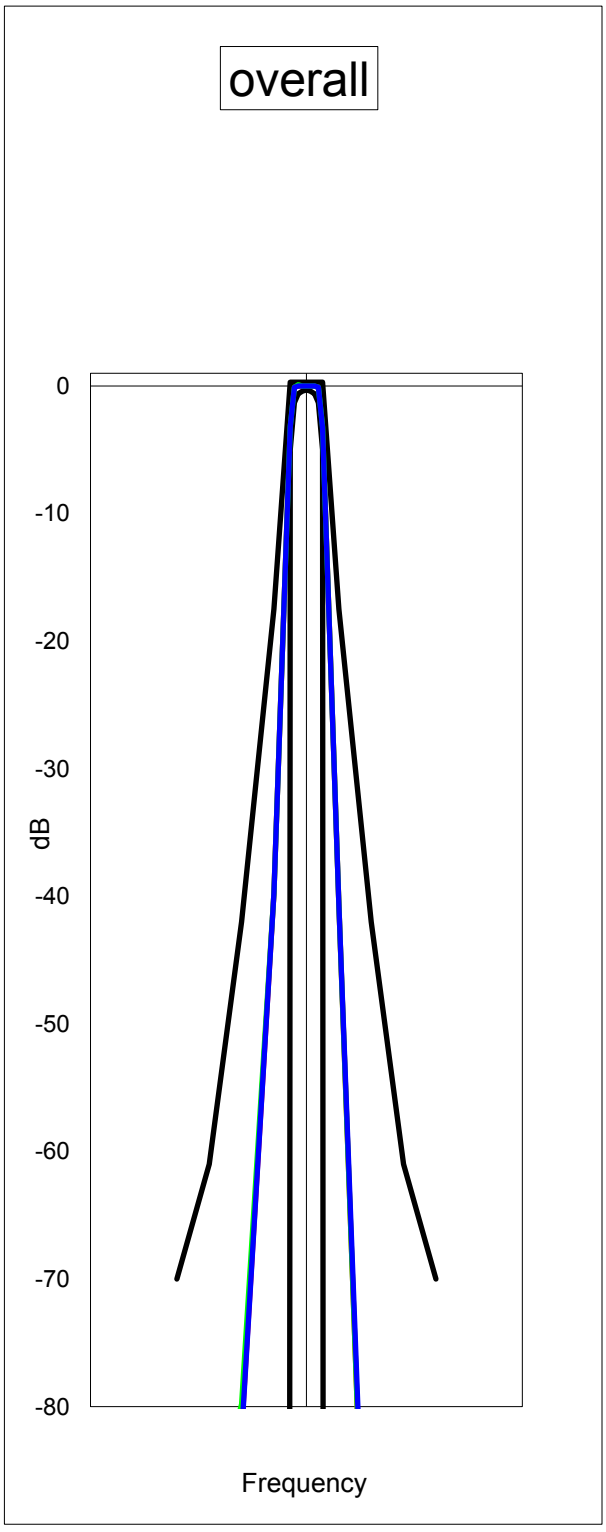
2500 Hz band	
Freq, Hz	Atten, dB
465.857	82.5
822.597	65.6
1334.90	47.3
1940.62	22.4
2238.76	3.6
2309.89	0.8
2379.25	0.1
2446.64	0.0
2511.90	Ref
2578.89	0.0
2651.94	0.1
2731.59	0.9
2818.38	3.9
3251.33	22.6
4726.72	48.5
7670.46	>110.0
13544.0	>110.0

Attenuation limits, dB
$70.0 \le \Delta \le \infty$
$61.0 \le \Delta \le \infty$
$42.0 \le \Delta \le \infty$
$17.5 \le \Delta \le \infty$
$-0.3 \le \Delta \le 5.0$
$-0.3 \le \Delta \le 1.3$
$-0.3 \le \Delta \le 0.6$
$-0.3 \le \Delta \le 0.4$
$-0.3 \le \Delta \le 0.3$
$-0.3 \le \Delta \le 0.4$
$-0.3 \le \Delta \le 0.6$
$-0.3 \le \Delta \le 1.3$
$-0.3 \le \Delta \le 5.0$
$17.5 \le \Delta \le \infty$
$42.0 \le \Delta \le \infty$
$61.0 \le \Delta \le \infty$
$70.0 \le \Delta \le \infty$

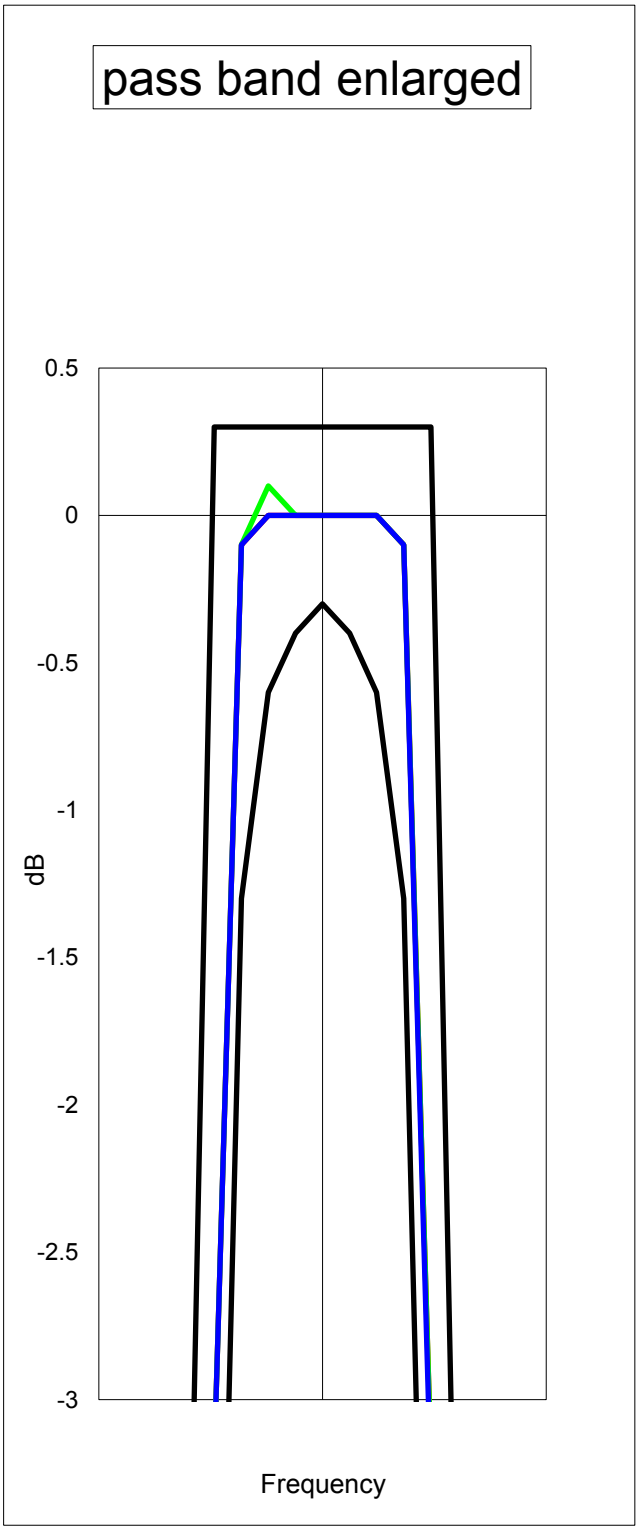
OCTAVE FILTERS

black	IEC 61260 limits	green	125 Hz band
red	1000 Hz band	blue	2000 Hz band

overall



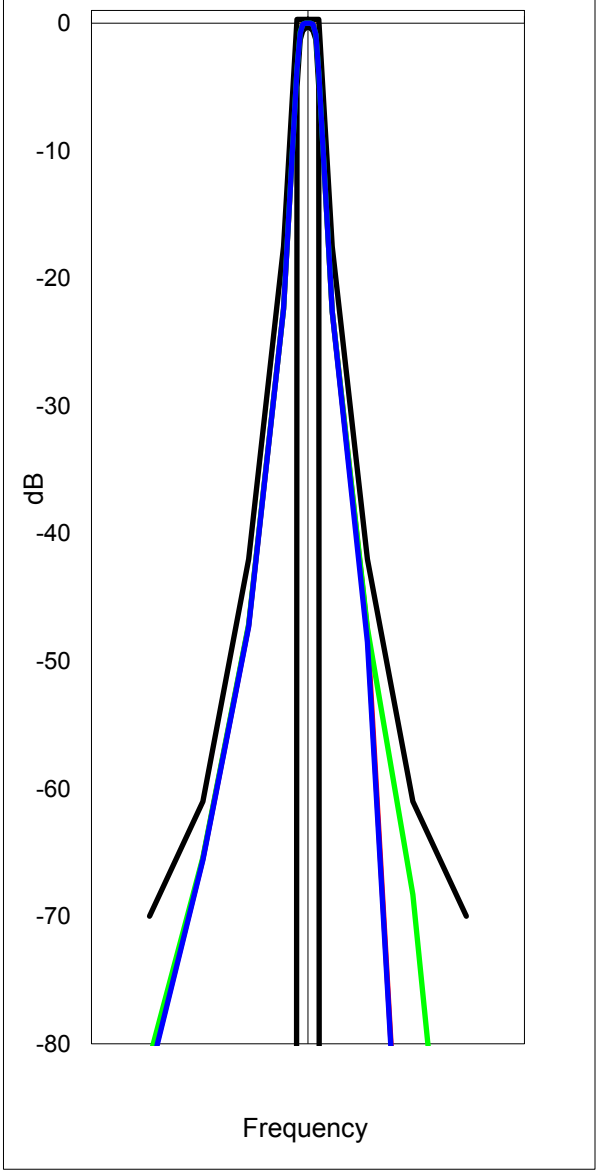
pass band enlarged



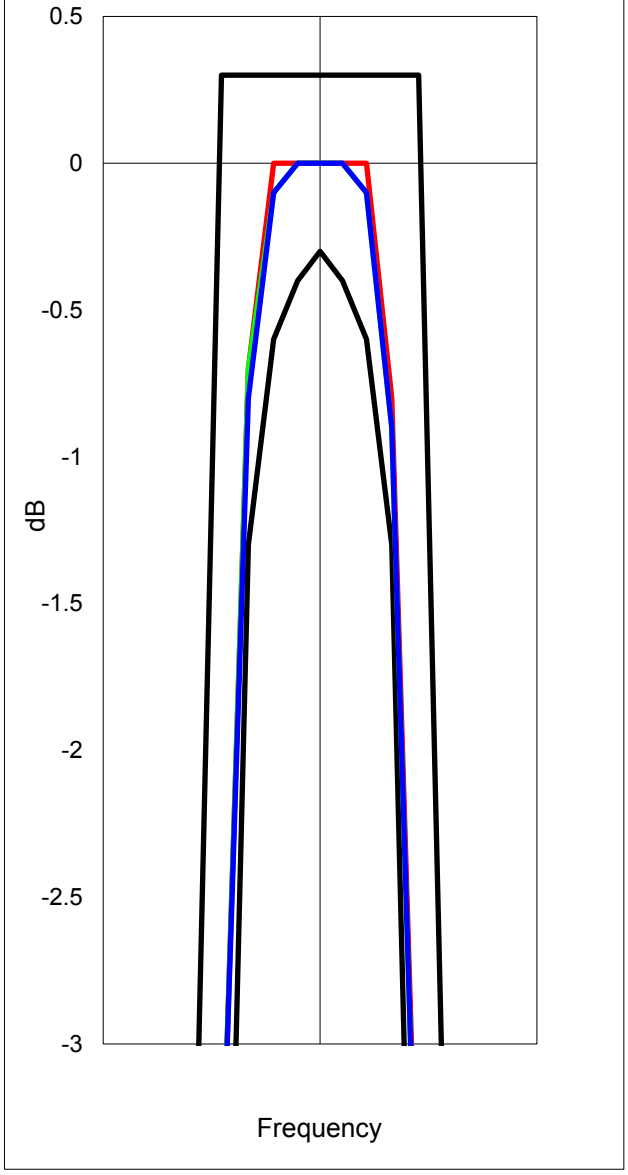
THIRD OCTAVE FILTERS

black	IEC 61260 limits	green	100 Hz band
red	1000 Hz band	blue	2500 Hz band

overall



pass band enlarged



END

R 2

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 21 April 2022

Certificate Number: UCRT22/1552

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

K. Mistry

Customer	Wood Group UK Ltd St Vincent Plaza St Vincent Street Glasgow G2 5LD
Order No.	26010406
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	01265412
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	65414
Rion	Microphone	UC-59	10633
Brüel & Kjær	Calibrator	4231	2052327
	Calibrator adaptor type if applicable		UC 0210

Performance Class 1

Test Procedure TP 10. SLM 61672-3:2013

Procedures from IEC 61672-3:2013 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2013 Yes

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013

Date Received 19 April 2022 ANV Job No. UKAS22/04276

Date Calibrated 21 April 2022

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	22 May 2020	UCRT20/1446	0653

CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number
UCRT22/1552

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1		
SLM instruction manual ref / issue	No. 56034 21-03	Source	Rion
Date provided or internet download date	19 March 2021		

	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections
Uncertainties provided	Yes	Yes	Yes

Total expanded uncertainties within the requirements of IEC 61672-1:2013	YES		
Specified or equivalent Calibrator	Equivalent		
Customer or Lab Calibrator	Customers Calibrator		
Calibrator adaptor type if applicable	UC 0210		
Calibrator cal. date	20 April 2022		
Calibrator cert. number	UCRT22/1540		
Calibrator cal cert issued by Lab	0653		
Calibrator SPL @ STP	94.11	dB	Calibration reference sound pressure level
Calibrator frequency	999.79	Hz	Calibration check frequency
Reference level range	Single	dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - The Extension Cable was used between the SLM and the pre-amp for this calibration.

Environmental conditions during tests	Start	End	
Temperature	24.50	24.30	± 0.30 °C
Humidity	40.6	42.2	± 3.00 %RH
Ambient Pressure	100.24	100.20	± 0.03 kPa

Indication at the Calibration Check Frequency				
Initial indicated level	94.2	dB	Adjusted indicated level	94.1 dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±				0.10 dB

Self Generated Noise

Microphone installed - Less Than 17.9 dB A Weighting

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	11.7	dB	UR	15.5	dB	UR	20.8	dB	UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

..... END .....

Calibrated by: B. Giles

R 3

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 21 April 2022

Certificate Number: UCRT22/1548

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

K. Mistry

Customer	Wood Group UK Ltd St Vincent Plaza St Vincent Street Glasgow G2 5LD
Order No.	26010406
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	01265434
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	65436
Rion	Microphone	UC-59	13122
Brüel & Kjær	Calibrator	4231	2052327
	Calibrator adaptor type if applicable		UC 0210

Performance Class 1

Test Procedure TP 10. SLM 61672-3:2013

Procedures from IEC 61672-3:2013 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2013 Yes

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013

Date Received 19 April 2022 ANV Job No. UKAS22/04276

Date Calibrated 21 April 2022

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	27 May 2020	UCRT20/1451	0653

CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number
UCRT22/1548

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1		
SLM instruction manual ref / issue	No. 56034 21-03	Source	Rion
Date provided or internet download date	19 March 2021		

	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections
Uncertainties provided	Yes	Yes	Yes

Total expanded uncertainties within the requirements of IEC 61672-1:2013	YES

Specified or equivalent Calibrator	Equivalent		
Customer or Lab Calibrator	Customers Calibrator		
Calibrator adaptor type if applicable	UC 0210		
Calibrator cal. date	20 April 2022		
Calibrator cert. number	UCRT22/1540		
Calibrator cal cert issued by Lab	0653		
Calibrator SPL @ STP	94.11	dB	Calibration reference sound pressure level
Calibrator frequency	999.79	Hz	Calibration check frequency
Reference level range	Single	dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - The Extension Cable was used between the SLM and the pre-amp for this calibration.

Environmental conditions during tests	Start	End	
Temperature	23.68	24.32	± 0.30 °C
Humidity	41.1	39.9	± 3.00 %RH
Ambient Pressure	100.33	100.28	± 0.03 kPa

Indication at the Calibration Check Frequency				
Initial indicated level	94.1	dB	Adjusted indicated level	94.1 dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±				0.10 dB

Self Generated Noise									
Microphone installed -	Less Than	17.9	dB	A Weighting					
Microphone replaced with electrical input device -				UR = Under Range indicated					

Weighting	A			C			Z		
	13.1	dB	UR	17.4	dB	UR	22.8	dB	UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

..... END .....

Calibrated by: B. Giles

R 3

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 21 April 2022

Certificate Number: UCRT22/1545

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

K. Mistry

CUSTOMER	Wood Group UK Ltd St Vincent Plaza St Vincent Street Glasgow G2 5LD
ORDER No	26010406
Job No	UKAS22/04276
DATE OF RECEIPT	19 April 2022
PROCEDURE	Calibration Engineer's Handbook, section 25: periodic testing of sound level meters to IEC 61672-3:2006 (BS EN 61672-3:2006) as modified by UKAS TPS 49 Edition 2:June 2009
IDENTIFICATION	Sound level meter 01dB type DUO serial No 10510 connected via an extension lead type RAL135-10M and preamplifier type PRE 22 serial No 10275 to a half-inch microphone type GRAS 40CD serial No 154425 fitted with a 'DMK01' weatherproof outdoor windshield including nosecone type RA 0208. Associated calibrator 01dB type CAL31 serial No 86009 with a half-inch housing.
CALIBRATED ON	21 April 2022
PREVIOUS CALIBRATION	Calibrated on 01 July 2019, Certificate No. UCRT19/1748 issued by this laboratory.

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0653

The sound level meter was set up using the type CAL31 sound calibrator supplied; it was set to frequency weighting A, and initially read 93.4 dB which was correct. This reading was derived from Calibration Certificate no. UCRT22/1544 supplied by this laboratory and manufacturers' information on the free-field response of the sound level meter when fitted with the windshield. The calibration check frequency was 1kHz.

Procedures from IEC 61672-3:2006 (BS EN 61672-3:2006) as modified by UKAS TPS 49 Edition 2:June 2009 were used to perform the periodic tests.

RESULTS

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006 (BS EN 61672-3:2006), for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2 : 2003 (BS EN 61672-2 : 2003), to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1 : 2002 (BS EN 61672-1 : 2003), the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1 : 2002 (BS EN 61672-1 2003).

The self-generated noise recorded with the microphone replaced by the electrical input device was:

11.6 dB (A) 12.6 dB (C) 18.4 dB (Z)

The environmental conditions recorded at the start and end of testing were:

Start: 22 to 23 °C, 32 to 42 %RH and 100.3 to 100.4 kPa
End: 23 to 24 °C, 38 to 48 %RH and 100.3 to 100.4 kPa

Technical information including adjustment data specified in the manufacturers' User Manual DOC1112 - May 2015 H with further clarification from 01dB has been used to carry out this verification. These data include manufacturer-specified uncertainties for case reflections and windshield, but NOT for the microphone response.

Publicly-available evidence has been found that this configuration of the 01dB DUO sound level meter design has successfully undergone pattern evaluation in accordance with IEC 61672-2:2002 (BS EN 61672-2:2003) by Physikalisch-Technische Bundesanstalt (PTB), an independent testing organisation responsible for pattern approvals.

All measurement data are held at ANV Measurement Systems for a period of at least six years.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k*=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0653

Certificate No UCRT22/1545

NOTES

Any opinions or interpretations which may be expressed in the following notes are not UKAS Accredited.

1 The high pass filter was set to 10 Hz, the mic correction to 90° and the nosecone usage to "Yes".

2 No suitable microphone frequency response information was supplied with the instrument. It was therefore measured by this laboratory using the electrostatic actuator method. This response in isolation is not UKAS accredited.

3 The instrument was running application firmware version 2.35, metrology firmware version 2.12 and modem firmware version 08.01.106 on hardware version 3F2D3D

4 These periodic tests are valid ONLY for the instrument configuration shown on page 1 of this certificate and for 90° incidence of sound on the microphone.

5 When set up to read correctly in response to the sound calibrator, the sound level meter stored a calibration correction of -0.07 dB and a microphone sensitivity of 50.4 mV/Pa

6 Typical case reflection factors (for the DMK01 unit) specified by the manufacturer have been used for this verification.

The results on this certificate only relate to the items calibrated as identified above.

END

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 20 April 2022

Certificate Number: UCRT22/1544

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

K. Mistry

CUSTOMER	Wood Group UK Ltd St Vincent Plaza St Vincent Street Glasgow G2 5LD
ORDER No	26010406
Job No	UKAS22/04276
DATE OF RECEIPT	19 April 2022
PROCEDURE	Procedure TP 1 Calibration of Sound Calibrators
IDENTIFICATION	Sound Calibrator 01dB type CAL31 serial number 86009 with half-inch housing
CALIBRATED ON	20 April 2022
PREVIOUS CALIBRATION	Calibrated on 22 May 2020, Certificate No. UCRT20/1441 issued by this laboratory.

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0653

Certificate No UCRT22/1544

MEASUREMENTS

The sound pressure level generated by the Sound Calibrator in its half-inch configuration was measured using a B&K type 4134 microphone with the protective grid in position. The microphone sensitivity was traceable to National Standards.

RESULTS

The mean level of the calibrator output was

93.92 ± 0.10 dB rel 20 µPa

The fundamental frequency of the sound output was 1000.35 ± 0.12 Hz,
and its total distortion was (0.11 ± 0.02) %.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k*=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

During the measurements the laboratory environmental conditions were:

Temperature: 23 to 25 °C
Atmospheric pressure: 100.4 to 100.5 kPa
Relative humidity: 35 to 45 %

The tests carried out were as specified in Annex B of BS EN 60942:2003, but with five determinations of sound pressure level, and limited to the above level(s) & freq(s). As public evidence was available from a testing organisation responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the reqirements for pattern evaluation decribed in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2003.

The results on this certificate only relate to the items calibrated as identified above.

Calibrator adjusted No END R 2

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 20 April 2022

Certificate Number: UCRT22/1540

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

K. Mistry

Customer	Wood Group UK Ltd St. Vincent Plaza St. Vincent Street Glasgow G2 5LD			
Order No.	26010406			
Test Procedure	Procedure TP 1 Calibration of Sound Calibrators			
Description	Acoustic Calibrator			
Identification	*Manufacturer*	*Instrument*	*Model*	*Serial No.*
	Brüel & Kjær	Calibrator	4231	2052327

The calibrator has been tested as specified in Annex B of IEC 60942:2003. As public evidence was available from a testing organisation (PTB) responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2003.

ANV Job No.	UKAS22/04276	
Date Received	19 April 2022	
Date Calibrated	20 April 2022	
Previous Certificate	*Dated*	22 May 2020
	Certificate No.	UCRT20/1442
	Laboratory	0653

Measurements

The sound pressure level generated by the calibrator in its WS2 configuration was measured five times by the Insert Voltage Method using a microphone as detailed below. The mean of the results obtained is shown below. It is corrected to the standard atmospheric pressure of 101.3 kPa (1013 mBar) using original manufacturers information.

Test Microphone	*Manufacturer*	*Type*
	Brüel & Kjær	4134

Results

The level of the calibrator output under the conditions outlined above was

94.11	±	0.10 dB rel 20 µPa
114.13	±	0.10 dB rel 20 µPa

Functional Tests and Observations

The frequency at	94 dB	999.79	±	0.12 Hz
The frequency at	114 dB	999.79	±	0.12 Hz
The total distortion at	94 dB	0.24	±	0.03 % Distortion
The total distortion at	114 dB	0.15	±	0.03 % Distortion

During the measurements environmental conditions were

Temperature	23	to	24	°C
Relative Humidity	42	to	48	%
Barometric Pressure	100.7	to	100.8	kPa

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

The uncertainties refer to the measured values only with no account being taken of the ability of the instrument to maintain its calibration.

A small correction factor may need to be applied to the sound pressure level quoted above if the device is used to calibrate a sound level meter which is fitted with a free-field response microphone. See manufacturers handbook for details.

..... END .....

Note:

Calibrator adjusted prior to calibration?	NO	
Initial Level 1	N/A	dB
Initial Level 2	N/A	dB
Initial Frequency	N/A	Hz

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

Calibrated by: C. Hirlav

Sound power of plant for conventional area deplanting and demolition

Zone	Plant item	Activity	Plant Quantity	% on time	Sound power level, dBA L_w	Sound power corrected for no. & on time, dBA L_w	Total sound power per zone, dBA L_w
1	30t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	6	98	104	111	127
	20t machine	demolition of smaller structures and clearing of voids and gully's	2	98	106	109	
	8t machine	demolition of smaller structures and clearing of voids and gullies	2	75	98	99	
	articulated dumper	transportation of arisings to designated material processing area (crushing & screening)	2	98	108	111	
	loading shovel	to load arisings into the dumper	1	70	95	93	
	hydraulic breaker attachment	1x 50t machine, (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	120	125	
	hydraulic shear attachment	1x 90t machine (shearing of structural steel) 1x 50t machine (shearing of structural steel) 2x 30t mach	3	98	110	115	
	mechanical muncher attachment	1x 50t machine (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	108	113	
	telehandler	movement of oxy-propane tanks, movement of site equipment	1	98	107	106	
	dust suppression	dust suppression during masonry breaking out	3	70	107	110	
	materials handler	loading of steel shearing into 20t hgv for offsite recycling	1	85	106	106	
	20t hgv for transportation of shearing's offsite for recycling	transportation of metal shearing's offsite for recycling	3	98	115	119	
	burning equipment (personnel)	processing of steel plant items	20	98	93	106	
	scissor lift	soft stripping of structures	6	60	95	101	
	crusher	processing of concrete and masonry demolition arisings to produce an engineered fill	1	50	115	112	
	90t machine	stripping of cladding and masonry, controlled demolition of tall steel framed structures	1	45	118	115	
2	50t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	2	60	108	109	127
	30t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	6	98	104	111	
	20t machine	demolition of smaller structures and clearing of voids and gully's	2	98	106	109	
	8t machine	demolition of smaller structures and clearing of voids and gullies	2	75	98	99	
	articulated dumper	transportation of arisings to designated material processing area (crushing & screening)	2	98	108	111	
	loading shovel	to load arisings into the dumper	1	70	95	93	
	hydraulic breaker attachment	1x 50t machine, (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	120	125	
	hydraulic shear attachment	1x 90t machine (shearing of structural steel) 1x 50t machine (shearing of structural steel) 2x 30t mach	3	98	110	115	
	mechanical muncher attachment	1x 50t machine (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	108	113	
	telehandler	movement of oxy-propane tanks, movement of site equipment	1	98	107	106	
	dust suppression	dust suppression during masonry breaking out	3	70	107	110	
	materials handler	loading of steel shearing into 20t hgv for offsite recycling	1	85	106	106	
	20t hgv for transportation of shearing's offsite for recycling	transportation of metal shearing's offsite for recycling	3	98	115	119	
	burning equipment (personnel)	processing of steel plant items	20	98	93	106	
	scissor lift	soft stripping of structures	6	60	95	101	
	crusher	processing of concrete and masonry demolition arisings to produce an engineered fill	1	50	115	112	
	90t machine	stripping of cladding and masonry, controlled demolition of tall steel framed structures	1	45	118	115	
3	70t machine	demolish steel pump house structure from top down	2	60	110	111	127
	50t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	4	60	108	112	
	30t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	6	98	104	111	
	20t machine	demolition of smaller structures and clearing of voids and gully's	2	98	106	109	
	8t machine	demolition of smaller structures and clearing of voids and gullies	2	75	98	99	
	articulated dumper	transportation of arisings to designated material processing area (crushing & screening)	2	98	108	111	
	loading shovel	to load arisings into the dumper	1	70	95	93	
	hydraulic breaker attachment	1x 50t machine, (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	120	125	
	hydraulic shear attachment	1x 90t machine (shearing of structural steel) 2x 70t machine (shearing of structural steel) 2x 50t mach	3	98	110	115	
	mechanical muncher attachment	1x 50t machine (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	108	113	
	telehandler	movement of oxy-propane tanks, movement of site equipment	1	98	107	106	
	dust suppression	dust suppression during masonry breaking out	3	70	107	110	
	materials handler	loading of steel shearing into 20t hgv for offsite recycling	1	85	106	106	
	20t hgv for transportation of shearing's offsite for recycling	transportation of metal shearing's offsite for recycling	3	98	115	119	
	burning equipment (personnel)	processing of steel plant items	20	98	93	106	
	scissor lift	soft stripping of structures	6	60	95	101	
	crusher	processing of concrete and masonry demolition arisings to produce an engineered fill	1	50	115	112	
	mobile crane	to lift deplanted equipment and plant (cw trash screens)	1	50	105	102	
	single drum compactor	to compact engineered fill within cw inlet	1	75	109	107	
	50t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	2	60	108	109	
4	30t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	4	98	104	110	127
	articulated dumper	transportation of arisings to designated material processing area (crushing & screening)	2	98	108	111	
	loading shovel	to load arisings into the dumper	1	70	95	93	
	hydraulic breaker attachment	1x 50t machine, (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	120	125	
	hydraulic shear attachment	1x 50t machine (shearing of structural steel) 2x 30t machine (shearing and processing of steel)	3	98	110	115	
	telehandler	movement of oxy-propane tanks, movement of site equipment	1	98	107	106	
	dust suppression	dust suppression during masonry breaking out	3	70	107	110	
	materials handler	loading of steel shearing into 20t hgv for offsite recycling	1	85	106	106	
	20t hgv for transportation of shearing's offsite for recycling	transportation of metal shearing's offsite for recycling	3	98	115	119	
	burning equipment (personnel)	processing of steel plant items	12	98	93	104	
	scissor lift	soft stripping of structures	4	60	95	99	
	crusher	processing of concrete and masonry demolition arisings to produce an engineered fill	1	50	115	112	
	90t machine	stripping of cladding and masonry, controlled demolition of tall steel framed structures	1	45	118	115	
5	50t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	2	60	108	109	127
	30t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	6	98	104	111	
	20t machine	demolition of smaller structures and clearing of voids and gully's	2	98	106	109	
	8t machine	demolition of smaller structures and clearing of voids and gullies	2	75	98	99	
	articulated dumper	transportation of arisings to designated material processing area (crushing & screening)	2	98	108	111	
	loading shovel	to load arisings into the dumper	1	70	95	93	
	hydraulic breaker attachment	1x 50t machine, (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	120	125	
	hydraulic shear attachment	1x 90t machine (shearing of structural steel) 1x 50t machine (shearing of structural steel) 2x 30t mach	3	98	110	115	
	mechanical muncher attachment	1x 50t machine (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	108	113	
	telehandler	movement of oxy-propane tanks, movement of site equipment	1	98	107	106	
	dust suppression	dust suppression during masonry breaking out	3	70	107	110	
	materials handler	loading of steel shearing into 20t hgv for offsite recycling	1	85	106	106	
	20t hgv for transportation of shearing's offsite for recycling	transportation of metal shearing's offsite for recycling	3	98	115	119	
	burning equipment (personnel)	processing of steel plant items	20	98	93	106	
	scissor lift	soft stripping of structure	6	60	95	101	
	crusher	processing of concrete and masonry demolition arisings to produce an engineered fill	1	50	115	112	
	90t machine	stripping of cladding and masonry, controlled demolition of tall steel framed structures	1	45	118	115	
6	50t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	2	60	108	109	127
	30t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	6	98	104	111	
	20t machine	demolition of smaller structures and clearing of voids and gully's	2	98	106	109	
	8t machine	demolition of smaller structures and clearing of voids and gullies	2	75	98	99	
	articulated dumper	transportation of arisings to designated material processing area (crushing & screening)	2	98	108	111	
	loading shovel	to load arisings into the dumper	1	70	95	93	
	hydraulic breaker attachment	1x 50t machine, (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	120	125	
	hydraulic shear attachment	1x 90t machine (shearing of structural steel) 1x 50t machine (shearing of structural steel) 2x 30t mach	3	98	110	115	
	mechanical muncher attachment	1x 50t machine (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	108	113	
	telehandler	movement of oxy-propane tanks, movement of site equipment	1	98	107	106	
	dust suppression	dust suppression during masonry breaking out	3	70	107	110	
	materials handler	loading of steel shearing into 20t hgv for offsite recycling	1	85	106	106	
	20t hgv for transportation of shearing's offsite for recycling	transportation of metal shearing's offsite for recycling	3	98	115	119	
	burning equipment (personnel)	processing of steel plant items	20	98	93	106	
	scissor lift	soft stripping of structures	6	60	95	101	
	crusher	processing of concrete and masonry demolition arisings to produce an engineered fill	1	50	115	112	
	90t machine	stripping of cladding and masonry, controlled demolition of turbine hall structure	1	45	118	115	
7	50t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	2	60	108	109	127
	30t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	6	98	104	111	
	20t machine	demolition of smaller structures and clearing of voids and gully's	2	98	106	109	
	8t machine	demolition of smaller structures and clearing of voids and gullies	2	75	98	99	
	articulated dumper	transportation of arisings to designated material processing area (crushing & screening)	2	98	108	111	
	loading shovel	to load arisings into the dumper	1	70	95	93	
	hydraulic breaker attachment	1x 50t machine, (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	120	125	
	hydraulic shear attachment	1x 90t machine (shearing of structural steel) 1x 50t machine (shearing of structural steel) 2x 30t mach	3	98	110	115	
	mechanical muncher attachment	1x 50t machine (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	108	113	
	telehandler	movement of oxy-propane tanks, movement of site equipment	1	98	107	106	
	dust suppression	dust suppression during masonry breaking out	3	70	107	110	
	materials handler	loading of steel shearing into 20t hgv for offsite recycling	1	85	106	106	
	20t hgv for transportation of shearing's offsite for recycling	transportation of metal shearing's offsite for recycling	3	98	115	119	
	burning equipment (personnel)	processing of steel plant items	20	98	93	106	

Appendix 15B: Noise Level Prediction Details

Zone	Plant item	Activity	Plant Quantity	% on time	Sound power level, dBA L_w	Sound power corrected for no. & on time, dBA L_w	Total sound power per zone, dBA L_w
	scissor lift	soft stripping of structures	6	60	95	101	
	crusher	processing of concrete and masonry demolition arisings to produce an engineered fill	1	50	115	112	
	50t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	2	60	108	109	
8	30t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	4	98	104	110	127
	20t machine	demolition of smaller structures and clearing of voids and gully's	2	98	106	109	
	8t machine	demolition of smaller structures and clearing of voids and gullies	2	75	98	99	
	articulated dumper	transportation of arisings to designated material processing area (crushing & screening)	2	98	108	111	
	loading shovel	to load arisings into the dumper	1	70	95	93	
	hydraulic breaker attachment	1x 50t machine, (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	120	125	
	hydraulic shear attachment	1x 50t machine (shearing of structural steel) 2x 30t machine (shearing and processing of steel)	3	98	110	115	
	telehandler	movement of oxy-propane tanks, movement of site equipment	1	98	107	106	
	dust suppression	dust suppression during masonry breaking out	3	70	107	110	
	materials handler	loading of steel shearing into 20t hgv for offsite recycling	1	85	106	106	
	20t hgv for transportation of shearing's offsite for recycling	transportation of metal shearing's offsite for recycling	3	98	115	119	
	burning equipment (personnel)	processing of steel plant items	12	98	93	104	
	scissor lift	soft stripping of structures	4	60	95	99	
	crusher	processing of concrete and masonry demolition arisings to produce an engineered fill	1	50	115	112	
	50t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	2	60	108	109	
9	30t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	4	98	104	110	126
	20t machine	demolition of smaller structures and clearing of voids and gully's	2	98	106	109	
	8t machine	demolition of smaller structures and clearing of voids and gullies	2	75	98	99	
	articulated dumper	transportation of arisings to designated material processing area (crushing & screening)	2	98	108	111	
	loading shovel	to load arisings into the dumper	1	70	95	93	
	hydraulic breaker attachment	1x 50t machine, (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	120	125	
	hydraulic shear attachment	1x 90t machine (shearing of structural steel 1x 50t machine (shearing of structural steel) 2x 30t machi	3	98	110	115	
	mechanical muncher attachment	1x 50t machine (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	108	113	
	telehandler	movement of oxy-propane tanks, movement of site equipment	1	98	107	106	
	dust suppression	dust suppression during masonry breaking out	3	70	107	110	
	materials handler	loading of steel shearing into 20t hgv for offsite recycling	1	85	106	106	
	20t hgv for transportation of shearing's offsite for recycling	transportation of metal shearing's offsite for recyclin	3	3	115	104	
	burning equipment (personnel)	processing of steel plant items	20	98	93	106	
	scissor lift	soft stripping of structures	6	60	95	101	
	crusher	processing of concrete and masonry demolition arisings to produce an engineered fill	1	50	115	112	
	50t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures removal of	2	60	108	109	
10	30t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	4	98	104	110	127
	articulated dumper	transportation of arisings to designated material processing area (crushing & screening)	2	98	108	111	
	loading shovel	to load arisings into the dumper	1	70	95	93	
	hydraulic breaker attachment	1x 50t machine, (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	120	125	
	hydraulic shear attachment	1x 50t machine (shearing of structural steel) 2x 30t machine (shearing and processing of steel)	3	98	110	115	
	telehandler	movement of oxy-propane tanks, movement of site equipment	1	98	107	106	
	dust suppression	dust suppression during masonry breaking out	3	70	107	110	
	materials handler	loading of steel shearing into 20t hgv for offsite recycling	1	85	106	106	
	20t hgv for transportation of shearing's offsite for recycling	transportation of metal shearing's offsite for recycling	3	98	115	119	
	burning equipment (personnel)	processing of steel plant items and opening of transformer casings	12	98	93	104	
	scissor lift	soft stripping of structures	4	60	95	99	
	crusher	processing of concrete and masonry demolition arisings to produce an engineered fill	1	50	115	112	
	50t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	2	60	108	109	
11	30t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	4	98	104	110	127
	articulated dumper	transportation of arisings to designated material processing area (crushing & screening)	2	98	108	111	
	loading shovel	to load arisings into the dumper	1	70	95	93	
	hydraulic breaker attachment	1x 50t machine, (breaking out masonry) 2x 30t machine (breaking out masonry)	3	98	120	125	
	hydraulic shear attachment	1x 50t machine (shearing of structural steel) 2x 30t machine (shearing and processing of steel)	3	98	110	115	
	telehandler	movement of oxy-propane tanks, movement of site equipment	1	98	107	106	
	dust suppression	dust suppression during masonry breaking out	3	70	107	110	
	materials handler	loading of steel shearing into 20t hgv for offsite recycling	1	85	106	106	
	20t hgv for transportation of shearing's offsite for recycling	transportation of metal shearing's offsite for recyclin	3	98	115	119	
	burning equipment (personnel)	processing of steel plant items	12	98	93	104	
	scissor lift	soft stripping of structures	4	60	95	99	
	crusher	processing of concrete and masonry demolition arisings to produce an engineered fill	1	50	115	112	
	90t machine	stripping of cladding and masonry, demolition of tall steel framed structures	1	98	118	118	
12	50t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	2	98	108	111	127
	30t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	6	98	104	111	
	20t machine	demolition of smaller structures and clearing of voids and gully's	2	98	106	109	
	8t machine	demolition of smaller structures and clearing of voids and gullies	2	75	98	99	
	articulated dumper	transportation of arisings to designated material processing area (crushing & screening)	2	98	108	111	
	loading shovel	to load arisings into the dumper	1	98	95	95	
	hydraulic breaker attachment	1x 50t machine, (breaking out turbine pedestals) 2x 30t machine (breaking out turbine pedestals)	3	98	120	125	
	hydraulic shear attachment	1x 90t machine (shearing of structural steel) 1x 50t machine (shearing of structural steel) 2x 30t mach	3	98	110	115	
	mechanical muncher attachment	1x 50t machine (breaking out turbine pedestals) 2x 30t machine (breaking out turbine pedestals)	3	98	108	113	
	telehandler	movement of oxy-propane tanks, movement of site equipment	1	98	107	106	
	dust suppression	dust suppression during masonry breaking out	3	70	107	110	
	materials handler	loading of steel shearing into 20t hgv for offsite recycling	1	98	106	106	
	20t hgv for transportation of shearing's offsite for recycling	transportation of metal shearing's offsite for recyclin	3	98	115	119	
	burning equipment (personnel)	processing of steel plant items	26	98	93	107	
	scissor lift	soft stripping of structures	6	80	95	102	
	crusher	processing of concrete and masonry demolition arisings to produce an engineered fill	1	80	115	114	
	mobile crane	lifting and removal of reserve feed tanks	1	75	105	103	
	30t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	2	98	104	107	
13	30t machine	breaking out of masonry and sheering of structural steelwork and prefabricated structures	2	98	104	107	125
	20t machine	demolition of smaller structures and clearing of voids and gully's	2	98	106	109	
	8t machine	demolition of smaller structures and clearing of voids and gullies	2	75	98	99	
	articulated dumper	transportation of arisings to designated material processing area (crushing & screening)	2	98	108	111	
	loading shovel	to load arisings into the dumper	1	70	95	93	
	hydraulic breaker attachment	1x 50t machine, (breaking out masonry) 2x 30t machine (breaking out masonry)	1	98	120	120	
	hydraulic shear attachment	1x 50t machine (shearing of structural steel) 1x 30t machine (shearing and processing of steel)	2	98	110	113	
	mechanical muncher attachment	1x 50t machine (breaking out masonry) 1x 30t machine (breaking out masonry)	2	98	108	111	
	telehandler	movement of oxy-propane tanks, movement of site equipment	1	98	107	106	
	dust suppression	dust suppression during masonry breaking out	3	70	107	110	
	materials handler	loading of steel shearing into 20t hgv for offsite recycling	1	85	106	106	
	20t hgv for transportation of shearing's offsite for recycling	transportation of metal shearing's offsite for recyclin	3	98	115	119	
	burning equipment (personnel)	processing of steel plant items	20	98	93	106	
	scissor lift	soft stripping of structures	6	60	95	101	
	crusher	processing of concrete and masonry demolition arisings to produce an engineered fill	1	50	115	112	

Safestore Outline Construction Plant List				
Plant	**No.**	**on time (%)**	**Sound Power, dBA L_W**	**Sound power corrected for no. & on time, dBA L_W**
Single drum Compactor	1	75	109	107
Articulated dumper	5	75	108	114
90T Machine	1	75	118	117
70t Machine	1	75	110	109
50t Machine	2	75	108	110
30t Machine	4	75	104	109
20t machine	5	75	106	112
HGV loader low	8	75	108	116
Mobile Crane	4	75	105	109
Caterpillar crane 500t	1	100	106	106
Tower cranes	2	75	104	106
Generators	8	75	102	109
Manual gas cutting machines	6	75	107	113
Hand-held circular saws (petrol)	4	25	119	119
Pile drivers - impact	1	50	117	114
Manual welders	10	75	101	110
concrete mixers	3	75	108	112
Concrete pumps	2	75	103	105
telehandler	3	75	107	110
scissor lift	5	50	95	99
Total Sound power corrected for no. & on time, dBA L_W				**125**

Total sound powers of plant in Proposed Works area, 2029 & 2037

Year 8 (2029)	
Zone 4	127
Zone 5	127
Zone 6	127
Zone 7	127
Total Sound power, dBA L_W	**133**

Year 16 (2037)	
Zone 11	127
Zone 12	127
Zone 13	125
Safestore construction	125
Total Sound power, dBA L_W	**132**

Calculation of sound power level due to on site vehicle movements 2029 & 2037 (1 per hour)

Calculation of worst case sound level due to on site vehicle movements 2029 & 2037 (1 per hour)				
Plant	**No. per hour**	**Speed, km/h**	**Sound Power, dBA L_W**	**Sound power corrected for no. & on time, dBA L_W**
C2.34 Lorry	1	12	94	94
Total Sound power corrected for no. & on time, dBA L_W				**94**
Approx length of haul road, m				**300**
Percentage of assessment period when vehicles are present, %				**100**

Prediction of sound level due to on-site vehicle movements

Total sound power	Receptor	Propagation distance to centre of haul road r, m	Approx length of haul road, m	Approx. angle of view, °	Percentage of assessment period when vehicles are present, %	Estimated haul road sound level at receiver, dB $L_{Aeq,T}$ (not accounting for screening or reflections)
94	R1	3200	300	5	100	0
94	R2	3800	300	5	100	-2
94	R3	3400	300	5	100	-1
94	R4	2500	300	7	100	2
94	R5	2500	300	7	100	2
94	R6	650	300	26	100	14
94	R7	725	300	23	100	13
94	R8	970	300	18	100	10
94	R9	1350	300	13	100	7
94	R10	1450	300	12	100	7
94	R11	1500	300	11	100	6
94	R12	2500	300	7	100	2
94	R13	2950	300	6	100	1
94	R14	3250	300	5	100	0
94	R15	2800	300	6	100	1

Prediction of sound level due to activity in Proposed Works area, 2029

Receptor	Receiver	Approx. distance to NSR, m	Proportion of hard ground, %	Hard ground attenuation Kh, dB	Soft ground attenuation Ks, dB	Predicted noise level, dB $L_{Aeq,T}$		Predicted noise level, plant and vehicle movements, dB $L_{Aeq,T}$ (not accounting for screening or reflections)	BS 5228 threshold of significance, dBA	Threshold of significance – predicted noise level, dBA
						Plant noise	On-site vehicle movements			
R1	Dwellings on Marine Parade, Great Cumbrae	3200	10	50	61	46	0	46	65	-19
R2	Dwellings on Kaim View and Fairlieburne Gardens, Fairli	3800	10	52	62	44	-2	44	65	-21
R3	Dwellings on Main Road and Irvine Road, Fairlie	3400	10	51	61	45	-1	45	65	-20
R4	Dwellings at Fencefoot Farm, Fairlie	2500	10	48	58	48	2	48	65	-17
R5	Dwellings at Glenside Cottage, Fairlie Moor Road, Fairlie	2500	10	48	58	48	2	48	65	-17
R6	Hunterston House	650	10	36	43	63	14	63	65	-2
R7	Dwellings at Hunterston Castle (North Cottage and End Shed Hotel)	725	10	37	45	62	13	62	65	-3
R8	Dwellings at Campbelton Farm	970	10	40	48	58	10	58	65	-7
R9	Dwellings at 3 & 4 Thirdpart	1350	10	43	51	55	7	55	65	-10
R10	Dwellings at 2 & 5 Thirdpart	1450	10	43	52	54	7	54	65	-11
R11	Dwellings at 1 Thirdpart	1500	10	44	52	54	6	54	65	-11
R12	Dwellings at Portencross	2500	10	48	58	48	2	48	65	-17
R13	Dwelling at Carlung Lodge, Carlung Estate	2950	10	49	60	47	1	47	65	-18
R14	Dwellings at Bogriggs, Irvine Road, West Kilbride	3250	10	50	61	46	0	46	65	-19
R15	Golf course at West Kilbride Golf Links	2800	10	49	59	47	1	47	65	-18

Prediction of sound level due to activity in Proposed Works area, 2037

Receptor	Receiver	Approx. distance to NSR, m	Proportion of hard ground, %	Hard ground attenuation Kh, dB	Soft ground attenuation Ks, dB	Predicted noise level, dB $L_{Aeq,T}$		Predicted noise level, plant and vehicle movements, dB $L_{Aeq,T}$ (not accounting for screening or reflections)	BS 5228 threshold of significance, dBA	Threshold of significance – predicted noise level, dBA
						Plant noise	On-site vehicle movements			
R1	Dwellings on Marine Parade, Great Cumbrae	3200	10	50	61	45	0	45	65	-20
R2	Dwellings on Kaim View and Fairlieburne Gardens, Fairli	3800	10	52	62	43	-2	43	65	-22
R3	Dwellings on Main Road and Irvine Road, Fairlie	3400	10	51	61	44	-1	44	65	-21
R4	Dwellings at Fencefoot Farm, Fairlie	2500	10	48	58	47	2	47	65	-18
R5	Dwellings at Glenside Cottage, Fairlie Moor Road, Fairlie	2500	10	48	58	47	2	47	65	-18
R6	Hunterston House	650	10	36	43	62	14	62	65	-3
R7	Dwellings at Hunterston Castle (North Cottage and End Shed Hotel)	725	10	37	45	61	13	61	65	-4
R8	Dwellings at Campbelton Farm	970	10	40	48	57	10	57	65	-8
R9	Dwellings at 3 & 4 Thirdpart	1350	10	43	51	54	7	54	65	-11
R10	Dwellings at 2 & 5 Thirdpart	1450	10	43	52	53	7	53	65	-12
R11	Dwellings at 1 Thirdpart	1500	10	44	52	53	6	53	65	-12
R12	Dwellings at Portencross	2500	10	48	58	47	2	47	65	-18
R13	Dwelling at Carlung Lodge, Carlung Estate	2950	10	49	60	46	1	46	65	-19
R14	Dwellings at Bogriggs, Irvine Road, West Kilbride	3250	10	50	61	45	0	45	65	-20
R15	Golf course at West Kilbride Golf Links	2800	10	49	59	46	1	46	65	-19

16.

Traffic and Transport

Appendix 16A: Outline Construction Traffic Management Plan

November 2023

Appendix 16A:
Outline Construction Traffic Management Plan (CTMP)

1. Introduction

1.1 Overview

1.1.1 Hunterston B Nuclear Power Station (HNB) (hereafter referred to as the 'Site'), ceased generation of electricity on in January 2022. Defueling of the site commenced shortly after, with this process due to complete in 2025. Decommissioning, namely the dismantling and decommissioning of plant and buildings at the site, is anticipated to start shortly after this at the Site which is shown in Figure 1-1. Prior to the commencement of decommissioning activities at the Site, EDF Energy Nuclear Generation Limited (EDF), the current licensee of the Site, is legally required to gain consent to carry out the decommissioning project from the Office for Nuclear Regulation (ONR)) under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended) (EIADR).

1.1.2 WSP UK Limited has been commissioned by EDF to produce an Outline Construction Traffic Management Plan (CTMP) in response to a request from Transport Scotland during the technical engagement undertaken as part of the consultation for the application for consent from the ONR. The decommissioning works (the 'Proposed Works') will include the dismantling and deconstruction of buildings and structures in areas within and outside of the Nuclear Site License (NSL) boundary that are part of the power station. The Proposed Works also include the modification of the nuclear reactor buildings into the Safestore. The Proposed Works will be undertaken in three phases:

- Preparations for Quiescence phase;
- Quiescence phase; and
- Final Site Clearance phase.

1.1.3 The Proposed Works are expected to commence in approximately 2026 and be completed within approximately 12 years. The commencement date is subject to change but will not affect the duration.

1.1.4 This Outline CTMP sets out the anticipated activities which would generate decommissioning traffic over the work period and identifies potential mitigation and management measures to control any potential effects arising. It also considers all decommissioning traffic expected during the works from other activities on the site. It addresses the off-site impacts and identifies traffic management measures.

1.1.5 This Outline CTMP is based on assumptions set out within the Environmental Statement (ES) that accompanies the application for consent, and is intended to be finalised when the design of the Proposed Works has been finalised. In the event that the project design develops in a way that breaks these assumptions, this plan will be reviewed and updated as required.

1.1.6 Any update will be made in consultation and agreement from North Ayrshire Council (NAC) and Transport Scotland as the highway authorities.

1.2 Report purpose

1.2.1 The Outline CTMP details potential measures that could be implemented to provide mitigation for HNB Site operations during the Proposed Works. The Outline CTMP has been prepared to ensure that the management measures contained within this document minimise the likely impact on existing road users. The CTMP is a live document and will be reviewed prior commencing each phase to ensure solutions contained within the CTMP are up to date and remain appropriate.

1.2.2 The Outline CTMP aims to:

- Ensure the movement of people and materials in a safe, efficient, timely, and sustainable manner;
- Minimise the impact of traffic associated with the Proposed Works on the highway network;
- Minimise the impact and disruption on local communities where possible due to the impact of traffic associated with the Proposed Works;
- Minimise vehicle trips associated with the Proposed Works where possible; and
- Limit the impacts on the natural and built environment.

1.3 Consultation

1.3.1 Engagement has been undertaken with highways officers from NAC and Transport Scotland consultation from June 2021. The initial consultation, pre-application and technical engagements have been summarised in **Section 16.3** of **Chapter 16: Traffic and Transport** the Environmental Statement (ES).

1.4 Report structure

1.4.1 The remainder of this report is structured as follows:

- Section 2: Decommissioning traffic;
- Section 3: Access routes;
- Section 4: Traffic management measures
- Section 5: Traffic management governance and structure

1.5 Site Working hours

1.5.1 As per **Chapter 2: The Decommissioning Process**, HNB has operated a 24-hours a day, seven days a week operational working pattern through operations and subsequently defueling. During the Preparations for Quiescence phase, working hours will change to represent the different types and nature of ongoing activities on the Site. Whilst some aspects of active area deplanting may necessitate the need for maintaining shift working, the majority of the Proposed Works, such as conventional deplanting and deconstruction

and Safestore construction, will be limited to normal working hours between 07:30 and 18:00 hours Monday to Friday. There may be occasional infrequent exceptions to when the working day may be extended in order to complete specific items of work safely. During the Preparations for Quiescence phase, it is anticipated that security personnel will remain on site 24 hours a day, seven days a week, using shift arrangements.

1.5.2 Heavy good vehicle (HGV) operational hours will be confirmed by the Site Licensee in the CTMP prior to the commencement of the Proposed Works.

2. Decommissioning traffic

2.1.1 The following section describes vehicle types and traffic assumptions made in order to calculate the number of vehicle trips generated during the Proposed Works.

2.2 Vehicle classification

2.2.1 A number of vehicle types will be used during the course of the Proposed Works. The ES identifies the Preparations for Quiescence phase as the phase which will generate the highest traffic flows. During this phase it is estimated the Proposed Works will generate 100 cars or Light Goods Vehicles (LGVs) for site-based staff and 24 HGVs (including hazardous rubbles in two-way direction) daily.

2.3 Traffic generation

2.3.1 To calculate initial decommissioning traffic estimates, estimates of total HGV flows and light vehicle (LV) flows of construction staff were made and these numbers were then divided by the works duration and working days. This is considered to be representative of a worse case daily decommissioning traffic generation, which is assumed to be the most intensive in terms of decommissioning traffic generation.

2.3.2 All HGVs will have their paperwork and security checked prior to entering the licensed site. Also, a suitable security check will be conducted on the vehicles entering the Site.

Table 2.1 Trip generation during the decommissioning phases

Decommissioning Phase	Activity	Timescale	Max HGVs (vehs/day – two ways)	Max Car/LGV traffic (vehs/ day – two ways)
Preparation for Quiescence Phase	Deplanting and deconstruction, Active area deplanting, Waste processing and packaging	Y1- Y6	<11	100
	Deplanting and deconstruction (specifically, filling of turbine hall void), waste processing and processing	Y7-Y8	<24	100
	Safestore construction, deplanting and deconstruction	Y9 – Y10	<20	100
	Safestore construction, deplanting and deconstruction	Y11 – Y12	<10	100
Quiescence Phase		Y13 - Y81	-	

Decommissioning Phase	Activity	Timescale	Max HGVs (vehs/day – two ways)	Max Car/LGV traffic (vehs/ day – two ways)
Final Site Clearance Phase	Waste management centre construction/operation and decommissioning	Y82 – Y85	<23	<99
	Retrieval of interim level waste from debris vaults	Y86 - Y93	<23	<99
	Reactor dismantling	Y86 – Y93	<23	<99
	Site remediation for future re-use	Y94 – Y96	<23	<99

2.3.3 There will be a small number of Abnormal Indivisible Loads (AILs) required during the Preparation for Quiescence Phase which are not considered to be significant. An AIL assessment and swept path analysis will be undertaken should this be required.

3. Access routes

3.1 Introduction

3.1.1 This section considers the access routes for decommissioning traffic to the Works Area, particularly HGVs. The primary considerations for an access route strategy are:

- Use of the shortest route available from the location of the access points to the primary road network ('A' roads and the strategic road network (SRN));
- Avoiding single carriageway highways where alternatives are available;
- Use of established access routes; and
- Avoiding settlements and sensitive receptors where possible.

3.2 Primary access route

3.2.1 A primary access route has been identified, taking into consideration the transport network constraints in relation to the conveyance of decommissioning traffic to and from the Proposed Works.

3.2.2 HGVs including the tippers that will be used to import and export materials, will be required to follow preferred routes to and from the SRN and local road network, as required to comply with the Site's consent to decommission.

Current baseline

3.2.3 A detailed baseline of the current transport infrastructure in the study area is provided in HNB EIADR ES **Chapter 16: Traffic and Transport**.

Road access

3.2.4 The existing highway network is shown in **Figure 16.2** of the ES which also identifies the initial 6 anticipated routes that could be utilised to transport the waste, materials, plant, equipment, and personnel required for the delivery of the Proposed Works. The key local roads in the study area include:

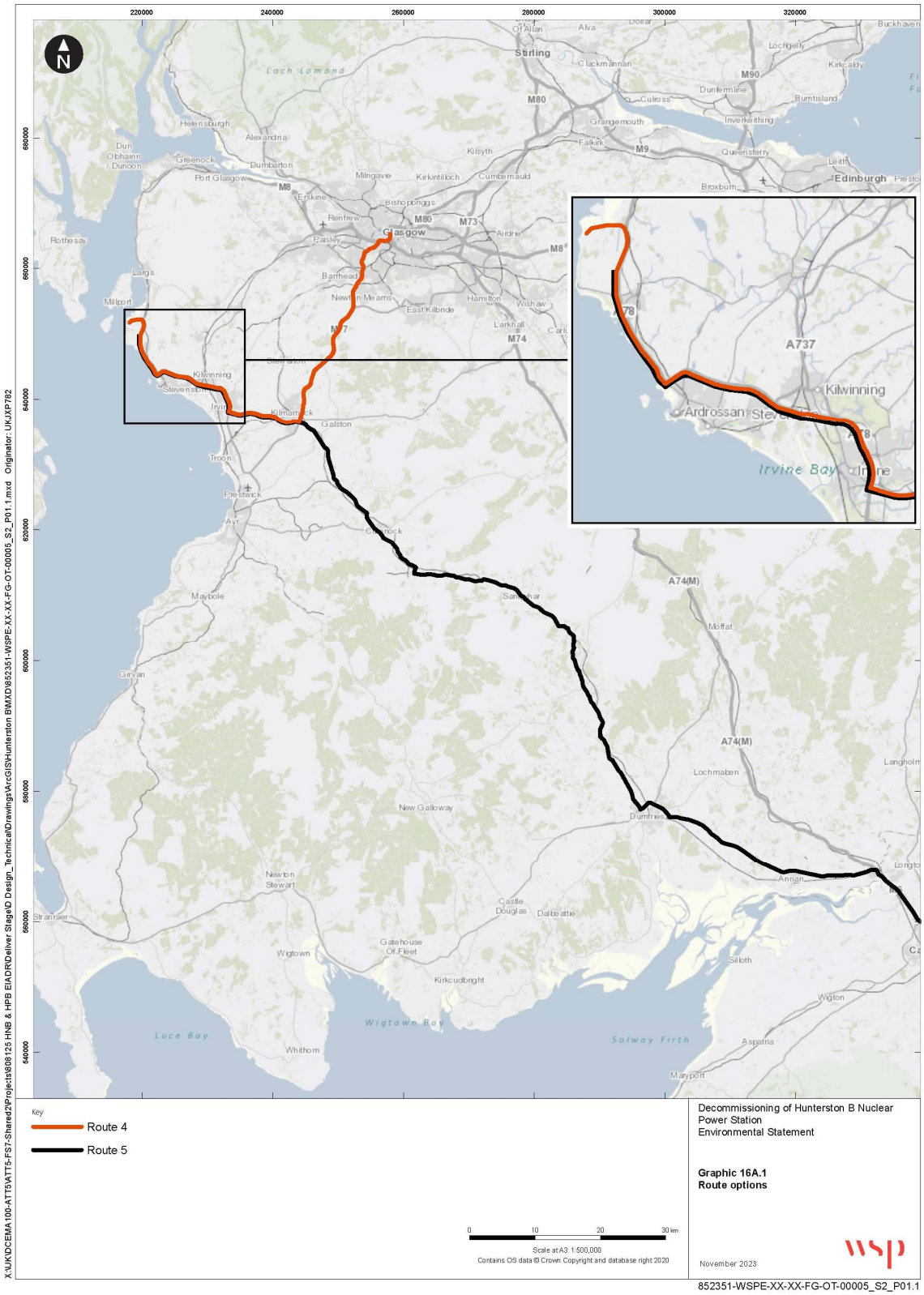
- Power Station Road
- A78
- A737
- A71
- A77
- A75
- A76

3.2.5 Following review of these key roads, two routes were identified as suitable for use by HGVs of the Proposed Works which are show on **Figure 3.1**:

- Route 4 as a suitable route from Glasgow and the M8 (via the M77, A71 and A78 at Irvine north to the Hunterston roundabout access to the Site); and

- Route 5 as a suitable route from the south from the M6 at Gretna (via the A75 to Dumfries and via the A76 to Kilmarnock and then on the A71 and the A78 to the Hunterston roundabout access to the Site).

Graphic 16A.1 Identified construction vehicle routes



Rail access

3.2.6 An existing railway line (Largs branch) runs to the east of the Site parallel with the A78, terminating at Largs. This line serves passenger stations at Fairlie to the north and West Kilbride to the south of the Site. These stations are both more than a 1 hour walk from the entrance to HNB and are therefore considered impractical for use by commuting staff.

3.2.7 There is an existing railhead located at Hunterston Port which is used for the transfer of fuel flasks from HNB via Southannan Roundabout. This railhead is connected to the Largs branch line from which linkage to the Hunterston High Level and Hunterston Low Level sidings is possible. Road access to the Hunterston High Level siding from the A78 is restricted by the overbridge on Kilrusken Toll. It is not anticipated that rail will be used for the transportation of waste and materials to deliver the Proposed Works.

Water access

3.2.8 Hunterston Port provides deep water and bulk terminal facilities and is located approximately 2.5 km north-east of the Site.

Core paths

3.2.9 There are three Core Paths which are located within the Study Area as shown in Map 11 of the North Ayrshire Core Paths Plan document1 which are NC60, NC61 and NC36:

- NC60 is a coastal path which routes north-south direction along the coast to Portencross and West Kilbride and to other core path connections.
- NC61 routes north from the Site along Power Station Road to other core path connections near Hunterston Sands.
- NC36 routes in a north-south direction and crosses Oilrig Road and joins NC61 near Power Station Road.

Car parking

3.2.10 The HNB power station is served by two car parks. Staff and visitor parking is provided by a large car park to the south-east of the Power Station Roundabout. There is a smaller additional overflow car park provided to the north-east of the Power Station Roundabout. There are further car parks to the south which are utilised by HNA.

Bus services

3.2.11 Bus services in the area around the Site are limited due to the Site's rural location. The 585 bus serves settlements along the A78 corridor from Ardrossan to Greenock. The bus stops located closest to the Site, which are served by the 585 service, are in the settlements of Fairlie (around 4.8 km walking distance to the north) and West Kilbride (around 5.6 km walking distance to the south). These distances are longer than an acceptable walking distance.

[1] North Ayrshire Council (2009). North Ayrshire Core Paths Plan – Map 11 (Online). Available at: CorePathsPlanMap11 (north-ayrshire.gov.uk))

Cycling

3.2.12 No dedicated cycling infrastructure is provided to access the Site. National Cycle Route (NCR) 753 starts/ends at Seamill, West Kilbride (7.8 km to the south-east of the Site NCR 753 routes from West Kilbride to Ardrossan and other NCR connections. The A78 between Fairlie and West Kilbride has a shared cycleway/footway located on the western side of the carriageway over approximately 360 m.

3.3 Local road safety

3.3.1 The results of a review of the accident record show accident hot spots in Beith, Kilwinning and Kilmarnock which affect any route via the A737 and M77.The additional two-way HGV movements per day on the road network generated by the Proposed Works, will be negligible compared to the existing average daily flow within the study area and thus would not be expected to lead to a noticeable increased frequency of accidents.

Trip generation

3.3.2 The Preparations for Quiescence phase is assumed to be a worst-case phase. During this phase, the year 2033 has been identified as the worst-case year when the Proposed Works is estimated to generate an additional 100 cars or Light Good Vehicles (LGVs) for operational site-based staff and 24 HGVs (including hazardous waste in two-way direction) daily.

4. Traffic management measures

4.1 Introduction

4.1.1 To minimise the impact of decommissioning traffic on the local road network and local communities surrounding the HNB site, off-site traffic management measures have been identified.

4.1.2 The routing strategies set out in Section 3 additional mitigation measures to those set out in this section. These routing strategies are the principal measures to manage the impacts of decommissioning traffic.

4.1.3 The following measures are proposed to additionally reduce the impacts on the local highways network and local users.

4.1.4 To date, there has not been an identified need for temporary parking restrictions to manage the HGV movements during the Proposed Works, and Temporary Traffic Regulation Order (TTRO) applications are not anticipated to be required.

4.2 HGV emissions and noise

4.2.1 All vehicles used for the Proposed Works will be to Euro standard IV class. The drivers should avoid idling their engines for large periods of time and keep speeds low. Due to the very long programme, the vehicle specifications requirement will be reviewed in line with technological advances during each phase.

4.3 Wheel cleaning and vehicle sheeting

4.3.1 If necessary, the Contractor will deploy a mechanical road sweeper, manual sweeping, scraping and/or jet washing to further ensure the site roads remains clear of dirt and debris to avoid carryover onto local roads.

4.3.2 Vehicles carrying loads that could generate dust will be sheeted, where appropriate, to minimise the amount of debris transferred to the local road network.

4.4 Information packs and communications

4.4.1 Information packs will be provided to contractors engaged to deliver the Proposed Works. The information pack will contain the details of the following CTMP requirements:

- Decommissioning transport routes;
- Internal road layout;
- CTMP protocols;
- Guidance on standard communication procedures between contractors and the Site; and
- Site contacts (emergency and non-emergency).

4.4.2 A timetable will be developed at peak periods and communicated to the suppliers to help minimise queues and delays in the vicinity of the proposed work area, by ensuring that HGV delivery vehicles to Site are distributed across the working day where practicable.

4.4.3 The timing of HGV movements to the Site related to the Proposed Works, will be confirmed by the Site Licensee via the CTMP. Upon commencement, all deliveries, operatives and visitors to the Site will report to the security gate. This will be communicated to all contractors at their pre-start meeting and in the site information.

4.4.4 The Information Pack will be issued to suppliers in advance of the delivery date to allow the supplier to inform their drivers and the drivers to become familiar with the Site layout and safety procedures prior to entering the Site.

4.4.5 The main contractor will develop a site layout plan highlighting the access point for the project, loading bay, pedestrian/vehicular segregation, welfare, storage, security and material handling that would be enforced following full site establishment.

4.4.6 Approved decommissioning vehicle routes to the Site will be confirmed by the Site Licensee and included in the CTMP, and protocols put in place to ensure that HGV drivers adhere to these routes. The Site Licensee will ensure that the road works register is checked when planning routes. During the closure of the North Flank of the M8, vehicles will be directed to use the A74 instead.

4.4.7 Given the remote location of the Site in relation to the public transport network, the opportunity for employees and contractors to travel to work by public transport is not considered practical. The distance of the Site from the established cycle network and lack of footway connections to local amenities and establishments means that travel to work by active modes is unlikely to be chosen by employees and contractors. However, car sharing is something that can be promoted. To identify and support travel choice initiatives, a site travel information pack such as existing public transport information and car-sharing club could be developed and distributed to construction staff.

5. Traffic management governance and structure

5.1 Introduction

5.1.1 It is important that a strong management structure is in place to oversee the CTMP and ensure the CTMP objectives are met and that continued monitoring and review of the CTMP is maintained. The Site Licensee will consider assigning someone to act as a Transport Co-ordination Officer (TCO) for traffic movements on the Site and will oversee the interface between the Proposed Works, with other planned activities onsite.

5.2 Monitoring and review

5.2.1 The Site Licensee will undertake monitoring as necessary to ensure compliance with the requirements of the CTMP, this will include the maintenance of traffic management measures. Short reviews – called Project Safety Reviews (PSR) – will look at specific risks associated with decommissioning.

5.3 Compliance

5.3.1 To ensure all parties, including staff and visitors, understand and comply with the requirements set out in the CTMP, enforcement procedures and arrangements will be updated as part of the car park risk assessment. The risk assessment will outline the relevant traffic management controls in place (speed limit, traffic calming measures employed and enforcement procedures for those seen not following site rules).

5.4 Enforcement and corrective measures

5.4.1 Staff will submit a Learning Capture Form (LCF) for any vehicle/pedestrian accidents, any vehicle/pedestrian near misses and any unsafe vehicle movements observed off-site and on-site (which includes vehicles not following CTMP and Site rules). Additional monitoring and review will be carried out as part of Project Safety Review (PSR) process and relevant actions taken where relevant.

Appendix 16B: Safety Data

Appendix 16B Safety Data

Road Section	06/09/18 to 06/09/23			Approximate Length of Road Section (km)	AADT		Estimated Annual Traffic Flow	Estimated million vehicle km (MVKM)	Average Annual PIA Rate per MVKM
	Fatal*	Total*	Average Annual PIA Rate		Flow	Source and Year			
A78 between Power Station Road and A77	1	58	11.6	24.9	6,598	Drakewell C2-Traffic 2023	2,408,270	60	0.19
					10,257	Drakewell C2-Traffic 2023	3,743,805	93	0.12
					13,856	Drakewell C2-Traffic 2023	5,057,440	126	0.09
					33,992	Drakewell C2-Traffic 2023	12,407,080	309	0.04
					16,333	Drakewell C2-Traffic 2023	5,961,545	148	0.08
					7,659	DfT 2022	2,795,535	70	0.17

Road Section	06/09/18 to 06/09/23			Approximate Length of Road Section (km)	AADT		Estimated Annual Traffic Flow	Estimated million vehicle km (MVKM)	Average Annual PIA Rate per MVKM
	Fatal*	Total*	Average Annual PIA Rate		Flow	Source and Year			
A77 between A71 and M77	2	18	3.6	7	20,756	DfT 2022	7,575,940	53	0.07
					46,060	Drakewell C2-Traffic 2023	16,811,900	118	0.03
					45,323	Drakewell C2-Traffic 2023	16,542,895	116	0.03

* Data Source: Transport Scotland Accident Manager Database extracted on 24/10/23

18.

Major Accidents and Disasters

Appendix 18A: Major Accidents and disasters criteria for magnitude

Appendix 18A
Major accidents and disasters criteria for magnitude

18A.1.1 The ES methodology in **Chapter 18: Major accidents and disasters**, **Section 18.6** describes the method used to assess the significance of a major accident and disaster effect for the Environmental Statement (ES). This appendix describes the magnitude criteria used to assess the damage/harm arising from a potential major accident and disaster, and the reasons for their selection. The criteria apply to the major hazard and disaster assessment and do not apply to other chapters.

18A.1.2 Effects that are relevant to the Proposed Works, but do not meet the magnitude thresholds fora major accidents and disasters, are assessed in other chapters, for example **Chapter 8: Terrestrial biodiversity and ornithology** and **Chapter 9: Marine biodiversity** if they are considered likely and reasonably foreseeable. This means that a comprehensive range of effects will be addressed under the different aspects of the ES overall.

Magnitude criteria

18A.1.3 These criteria are aligned to and largely extracted from definitions used in commonly applied major hazard guidance for the environment CDOIF[30] and risk tolerability criteria for people applied by the Health and Safety Executive[45].

18A.1.4 The criteria in the CDOIF and HSE guidance for each receptor group was established with input from relevant specialists (such as ecologists and surface water specialists for non-human environmental criteria) to confirm the relevance and vulnerability of potential receptors (e.g., particular species) and, using their professional judgement, to provide input on the extent and nature of harm and recovery time.

18A.1.5 In relation to major accidents and disasters' magnitude criteria the following factors are important:

- For non-human receptor groups, both severity of harm, **Table 18A.1**, and duration of harm (i.e. its persistence - the recovery period over which the environment would be restored), **Table 18A.2** combine to establish the magnitude level, **Table 18A.** 3.
- For human receptors, both severity of harm (see **Table 18.A4**) and the number of people affected (see **Table 18A.5**) combine to establish the estimate of magnitude level, as shown in **Table 18A.6**.

18A.1.6 To distinguish between potential major accidents of differing scale, the magnitude of potential major accidents and disasters are categorised into one of four categories: **Low, Medium, High,** and **Very High**. Any scenario which does not meet the criteria of a major accident or disaster is simply listed is **Not MA&D** (i.e., not major accident and disaster).

Receptor Sensitivity

18A.1.7 Receptor sensitivity, which relates to the intrinsic value and/ or sensitivity of receptors, is embedded within the 'severity of harm,' 'duration of harm' and number of people affected criteria to establish their threshold levels and scaling factors. For this reason, receptor sensitivity is not explicitly considered in the major accidents and disasters assessment.

Magnitude of Harm – Non-human Receptors Groups

18A.1.8 The environmental (non-human) criteria have been directly extracted from that of the CDOIF guidance[30] which sets a maximum or minimum severity ranking for some receptors. Where this is the case, the severity of harm categories that do not apply to those receptors are noted as non-applicable (N/A) in **Table 18A.1**.

18A.1.9 Four categories of severity of harm criteria are considered (see **Table 18A.1**):

- **Not Significant**[1]: Any scenario which does not meet the criteria of a major accident or disaster, then it is simply listed is Not MA&D (i.e., not major accident and disaster). This level of harm is below the minimum threshold determined for a major accident or disaster in the CDOIF[30] (for non-human receptor groups) guidance; and
- **Severe, Large, Very Large**: These represent increasing magnitudes of harm or damage to populations or environmental receptors.

18A.1.10 In **Table 18A.1**, where two threshold parameters are given within a single category, e.g., <0.5 ha or 10% of a designated site of national importance, the lesser of the two is taken to be the threshold for a given receptor. This ensures there is no gap between the 'severity of harm' categories.

[1] The CDOIF guidance used the terminology of 'significant' for this severity of harm and defines it as a level of harm which might lead to significant pollution, but one which is not considered a major accident or disaster. While the CDOIF guidance uses the term 'significant' for this, this is very different to how the term is used in ES and therefore this criterion term has been replaced by 'not significant' for ES purposes.

18A.1.11 In line with the CDOIF[30] and Department for the Environment, Transport and Regions (DETR) guidance[26], destruction of Category B or C listed buildings are not considered to be a major accident as they are not considered to be historic and heritage assets of the highest significance under the Scottish listed building system of Category A, B & C[2]. However, if the incident which led to their destruction could endanger human life, or a relevant population of particular species, then it would be considered as a major accident under the appropriate receptor. However, Category A buildings are those of 'national architectural or historic importance' according to the DETR guidance[25] and are afforded an additional level of protection.

[2] Historic Environment Scotland (2022) Categories of Listing. (online) Available at: https://www.historicenvironment.scot/advice-and-support/listing-scheduling-and-designations/listed-buildings/what-is-listing/#categories-of-listing_tab (Accessed on 21 August 2023)

Table 18A.1 Major accidents and disasters severity of harm criteria (non-human receptor groups)

	Severity of harm			
Receptor Type	**Not Significant**	**Severe**	**Large**	**Very Large**
Designated land/ water sites (internationally important)	<0.5 ha or <5% (<5% linear feature or population).	>0.5 ha or 5-25% of site area or 5-25% of associated linear feature or population.	25-50% of site area, associated linear feature or population.	>50% of site area, associated linear feature or population.
Designated land/ water sites (nationally important)	<0.5 ha or <10%.	>0.5 ha or 10-50% of site area, associated linear feature or population.	>50% of site area, associated linear feature population.	N/A.
Other designated land	<10 ha or <10%.	10-100 ha or 10-50% of land.	>100ha or >50% of land.	N/A.
Scarce habitat	<2 ha or <10%.	2-20 ha or 10-50% of habitat.	>20ha or >50% of habitat.	N/A.
Widespread habitat (non-designated land)	<10ha.	Contamination of 10-100 ha of land, preventing growing of crops, grazing of domestic animals or renders the area inaccessible to the public because of possible skin contact with dangerous substances. Alternatively,	100 – 1,000ha (applied as per text under 'Severe').	>1,000ha (applied as per text under 'Severe').

	Severity of harm			
Receptor Type	**Not Significant**	**Severe**	**Large**	**Very Large**
		contamination of 10ha or more of vacant land.		
Widespread habitat (non-designated water)	N/A.	Contamination of aquatic habitat which prevents fishing or aquaculture or renders it inaccessible to the public.	N/A.	N/A.
Particular species (these criteria apply nationally)	Loss of <1% of animal or <5% of plant ground cover in a habitat.	Loss of 1-10% of animal or 5-50% of plant ground cover.	Loss of 10-90% of animal or 50-90% of plant ground cover.	Total loss (>90%) of animal or plant ground cover.
Fresh and estuarine water habitats	Impact below that indicated to be severe.	WFD chemical or ecological status lowered by one class for 2-10 km of watercourse or 2-20 ha or 10-50% area of estuaries or ponds. Interruption of drinking water supplies, as per Groundwater Source of Drinking Water.	WFD chemical ecological status lowered by one class for 10-200km of watercourse or 20-200ha or 50-90% area of estuaries and ponds. Interruption of drinking water supplies, as per Groundwater Source of Drinking Water.	WFD Chemical or ecological status lowered by one class for >200km of watercourse or >200ha or >90% area of estuaries and ponds. Interruption of drinking water supplies, as per Groundwater Source of Drinking Water.
Marine	<2 ha littoral or sub-littoral zone, <100 ha of open sea benthic community, <100 dead	2-20ha littoral or sub-littoral zone, 100-1,000ha of open sea benthic community, 100-	20-200ha littoral or sub-littoral zone, 100-10,000 ha of open sea benthic community, 1,000-	>200ha littoral and sub-littoral zone, >1,000ha of open sea benthic community, >10,000

	Severity of harm			
Receptor Type	**Not Significant**	**Severe**	**Large**	**Very Large**
	sea birds (<500 gulls), <5 dead/ significantly impaired sea mammals.	1,000 dead sea birds (500-5,000 gulls), 5-50 dead/ significantly impaired sea mammals	10,000 dead sea birds (5,000-50,000 gulls), 50-500 dead/ significantly impaired sea mammals.	dead sea birds (>50,000 gulls), >500 dead/ significantly impaired sea mammals.
Groundwater source of drinking water	Interruption of drinking water supply <1,000 person-hours.	Interruption of drinking water supplied from a ground or surface source (where persons affected x duration in hours (at least 2) >1,000).	>1 x 10^7 person-hours interruption of drinking water (a town of ~100,000 people losing supply for month).	>1 x 10^9 person-hours interruption of drinking (~1 million people losing supply for 1 month).
Groundwater – non-drinking water source	<1ha.	1-100 ha of aquifer where water quality standards are breached (or hazardous substance is discernible).	100-10,000ha.	>10,000ha.
Soil or sediment	Contamination not leading to environmental damage (as per ELD), or not significantly, affecting overlying water quality.	Contamination of 10-100ha of land etc. as per widespread habitat; contamination sufficient to be deemed environmental damage (Environmental Liability Directive).	Contamination of 100-1,000ha of land, as per widespread habitat; contamination rendering the soil immediately hazardous to humans (e.g., skin contact) or the living environment, but remediation available.	Contamination of >1,000ha of land, as per widespread habitat; contamination rendering the soil immediately hazardous to humans (e.g., skin contact) or the living environment and remediation difficult or impossible.

	Severity of harm			
Receptor Type	**Not Significant**	**Severe**	**Large**	**Very Large**
Historic environment[3]	Damage below a level at which designation of importance would be withdrawn.	Damage sufficient for designation of importance to be withdrawn.	Feature of historic environment subject to designation of importance entirely destroyed.	N/A.

[3] Historic environment receptors are those where the NPPF considers their harm should be treated as 'wholly exceptional'. These are historic and heritage assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, Category A listed buildings, Inventory of Gardens and Designed Landscapes, and World Heritage Sites. Associated conservation areas that contribute to their significance are also included. Category B and C listed buildings will be assessed as non-designated land.

Duration of harm – non-human receptor groups

18A.1.12 The duration of harm, i.e., the recovery period, is also a factor in establishing criteria for the magnitude relating to major accidents and disasters on non-human receptors. This is given in **Table 18A.2**. The criteria are taken directly from the CDOIF guidance[30].

18A.1.13 In general terms a receptor which can recover quickly from an event is considered to have suffered a lesser level of harm than one that does not recover or recovers only after a very long time. This concept is recognised in the duration criteria, which takes account of the ability of the receptor to recover, and the importance given to the receptor by society. Duration criteria therefore differ by receptor type, and what is considered short term for one receptor type is not the same as that of another.

18A.1.14 Four categories of duration are considered: **Short, Medium, Long**, and **Very Long** term.

Table 18A.2 Major accidents and disasters duration of harm criteria (non-human receptor groups)

Description	Short term	Medium term	Long term	Very long term
Groundwater or surface water drinking water source (public or private)	N/A.	N/A.	Harm affecting drinking water source or Source Protection Zone (SPZ) <6 years.	Harm affecting drinking water source or SPZ >6 years.
Groundwater (except drinking water sources):	Water Framework Directive (WFD) hazardous substances <3 months.	WFD hazardous subs >3 months.	WFD hazardous subs >6 years.	WFD hazardous subs >20 years.
	WFD non-hazardous substances <1 year.	WFD non-hazardous substances >1 year.	WFD non-hazardous substances >10 years.	WFD non-hazardous substances >20 years.
Surface water (except drinking water sources - see above)	<1 year.	>1 year.	>10 years.	>20 years.

Description	Short term	Medium term	Long term	Very long term
Land	<3 years.	>3 years or >2 growing seasons for agricultural land.	>20 years.	>50 years.
Historic environment	Can be repaired in <3 years, such that its designation can be reinstated.	Can be repaired in >3 years, such that its designation can be reinstated.	Feature destroyed, cannot be rebuilt, all features except world heritage site.	Feature destroyed, cannot be rebuilt, world heritage site.

18A.1.15 Table 18A. 3 provides a matrix which combines the factors of severity of harm/damage criteria (see Table 18A.1) with duration of harm criteria (see Table 18A.2) to establish magnitude criteria.

Table 18A. 3 Magnitude matrix (non-human receptor groups)

	Duration of Harm			
Severity of Harm	**Short**	**Medium**	**Long**	**Very Long**
Very Large	Not MA&D	**High**	**Very High**	**Very High**
Large	Not MA&D	**Medium**	**High**	**Very High**
Severe	Not MA&D	**Low**	**Medium**	**High**
Not Significant	Not MA&D			

Magnitude of Harm – Human Receptor Groups

18A.1.16 The descriptions for population and human health severity criteria in **Table 18.A4** have been developed to include wider health, social and economic effects as well as direct physical harm. These effects are drawn from the Civil Contingencies guidance[15]. The descriptions incorporate relevant aspects of the health, social and economic effects in the guidance, tailored to the severity of harm levels used in **Table 18.A4** and major accidents and disasters that are relevant to the Proposed Works.

18A.1.17 As for non-human receptors, four categories of severity of harm criteria (see **Table 18.A4**) are considered:

- **Low:** simply listed as **Not MA&D** (i.e., not major accident and disaster). This level of harm is below the minimum threshold determined for a major accident or disaster in Reducing Risk Protecting People (R2P2)[45] (for human receptor groups); and
- **Medium, High, Very High:** These represent increasing magnitudes of harm or damage to populations or environmental receptors.

18A.1.18 Where the severity of harm is at the **'Low'** and **'Medium'** level, the severity of harm criteria for workers differs from that for members of the public. This is consistent with HSE's R2P2[45] which reasons that individual members of the public 'have the risk imposed on them 'in the wider interest of society' whereas workers accept the risk, have more control over it and benefit from the activity. It is also easier to separate the public from the hazard and therefore reduce their risk.

18A.1.19 Where the severity of harm is **'High'** or **'Very High'** i.e., a substantial number of fatalities and life changing injuries arise from a single event, the severity of harm is the same for the workers as for the public. In setting criteria for societal risk, the HSE does not make the distinction between workers and the public.

18A.1.20 Where the severity of harm is **'High'** or **'Very High'** the wider health, social and economic effects that apply differ slightly, reflecting the differences in how the public and workers may be affected. For example, damage to residential properties is an effect upon the public and is not applicable to workers.

Table 18.A4 Major accidents and disasters severity of harm criteria (human receptor groups)

	Severity of Harm			
Receptor Type	**Not Significant**	**Severe**	**Large**	**Very Large**
Human populations (public)	Small number of minor injuries.	Substantial number of people requiring medical attention. Events of this magnitude may also involve some damage to housing, with low numbers of people being displaced. Potential for localised interruption to utilities and damage to infrastructure.	Multiple life changing injuries and/ or potential loss of life in low numbers Events of this magnitude are also likely to involve: • many people requiring medical treatment; • many people suffering long term mental health issues related to the event; • housing and business premises rendered uninhabitable with many people displaced for extended periods; • Serious adverse medium-term economic effects locally; • high clean-up and recovery costs to the local community; • potential for disruption to regional infrastructure, utilities and services; and • incident requiring emergency response at County/Regional scale.	Potential loss of life in high numbers and/or substantial number of life changing injuries Events of this magnitude are also likely to involve: • very many people requiring medical treatment; • widespread mental health issues related to the event; • large areas of housing and business premises rendered uninhabitable with large numbers of people displaced for long extended periods; • extensive adverse long-term economic effects regionally and nationally; • extensive clean-up and recovery costs to society; • potential for disruption to regional infrastructure, utilities and services; and • incident requiring emergency response at National/International scale.
Human populations (workers)	Substantial number of people requiring medical attention.	Multiple life changing injuries.	Multiple life changing injuries and potential loss of life in low numbers. Events of this magnitude are also likely to involve: • many people suffering long term mental health issues related to the event; • serious adverse medium-term economic effects to locally; • high clean-up and recovery costs to the local community; • potential for disruption to regional infrastructure, utilities and services; and • incident requiring emergency response at County/Regional scale.	Potential loss of life in high numbers and substantial number of life changing injuries. Events of this magnitude are also likely to involve: • widespread mental health issues related to the event; • extensive adverse long-term economic effects regionally and nationally; • extensive clean-up and recovery costs to society; • potential for disruption to regional infrastructure, utilities and services; and • incident requiring emergency response at National/International scale.

Number of people affected

18A.1.21 For human receptors the magnitude is categorised based on the number of people affected (see **Table 18A.5**) to provide appropriate positioning against HSE risk tolerability concepts[48].

Table 18A.5 Number of people affected (human receptor groups)

	Low	Medium – High	Very High
Human Populations	Less than 5	10s of people	100s of people

18A.1.22 The combination of harm severity and people affected for human receptors to determine magnitude is given in **Table 18A.6**.

Table 18A.6 Major accidents and disasters duration of harm criteria (non-human receptor groups)

Severity of Harm	**Number of people affected**	
	Low to High	**Very High**
Very Large	**High**	**Very High**
Large	**Medium**	**High**
Severe	**Low**	**Medium**
Not Significant	Not MA&D	

Appendix 18B: Impact Assessment of scoped in scenarios

Table 18B.1 Scoped in scenarios with their impact on receptors

Scoped in scenario	Potential impact on receptors (worst case)	Embedded measures	Relevant Phases of the Project	Severity	Likelihood	Significance
Major accidents associated with the Proposed Works resulting from a fire/explosion and caused by accidental release of substances not regulated under COMAH, or when HNB is no longer regulated under COMAH.	Human population receptors The majority of chemicals and fuels will be removed during the Preparations for Quiescence phase but there will be some residual inventories of hazardous substances that will be removed during Final Site Clearance phase. There are no known explosive hazards other than remnant pressurised gases in piping systems where appropriate safety measures will be put in place to ensure that they have been depressurised and purged. Method statements for the identification and safe removal of all hazardous substances will be developed as the Proposed Works progress. Worst credible consequence: A small number (<5) serious or fatal injuries to onsite workers from fires or explosion during removal works. The impact to offsite receptors is anticipated to be minimal and limited to the impact of any smoke plume.	The Site Licensee will prioritise the removal of chemicals and fuels from the site as early as possible to allow safe decommissioning. Method statements for the identification and safe removal of all hazardous substances will be developed as the Proposed Works progress. The Site Licensee will maintain a Safety Management System for the full life of the Proposed Works. The SMS will be maintained to the same standard as currently implemented for complying with the COMAH Regulations. The SMS will incorporate the principals of the Health and Safety at Work etc. Act 1974 and require: The hierarchy of controls to be embedded in the design where inherently safer options are selected wherever practicable. All activities will be subject to a suitable and sufficient risk assessment considering the impacts on people and the environment. The residual risk of harm from all activities will be reduced to As Low As Reasonably Practicable (ALARP). The approach to the Proposed Works will be designed to reduce the risk so far as is practicable and then further preventative and control measures will be implemented to achieve ALARP. These additional measures will include: Site inspections will be carried out by all levels of management. Health and safety surveillances and audits will be carried out regularly by senior staff and safety officers. Segregated storage of flammable, oxidising and combustible materials, which are stored in designated locations with good ventilation. All systems handling flammable materials will be designed to the appropriate design standard considering isolation and shutdown requirements. Appropriate fire and gas detection systems installed in areas where there is a risk of fires. Fire alarms and where suitable, automated and manual firefighting systems will be installed. Emergency response procedures will consider the potential for fires and will define the actions to be	Preparations for Quiescence, Final Site Clearance	High	Very small chance of occurring	Not Significant
	Historic environment receptors Given the distance between the Proposed Works and the receptors and the low level of hazardous chemicals on site, it is not considered credible that a fire on site could damage a historic environment receptor sufficiently to lead to a loss of classification.		Preparations for Quiescence, Final Site Clearance	N/A	No MA&D	Not Significant

Scoped in scenario	Potential impact on receptors (worst case)	Embedded measures	Relevant Phases of the Project	Severity	Likelihood	Significance
		taken to minimize the risk arising from potential fires and prevent escalation.				
Major accidents associated with the Proposed Works. An accidental release of hazardous chemical not regulated under COMAH or firewater run-off contaminated with non-COMAH Dangerous Substances, or when HNB is no longer regulated under COMAH.	Human population receptors Various chemicals and fuels are used at the facility for current operations and, other than fuel, the storage of these will largely be removed prior to the PfQ phase. While there will be no storage of substances other than diesel fuel, there could be residual inventories of asphyxiants, and corrosive materials in pipework which could cause injuries or fatalities to workers through asphyxiation, cryogenic burns, or corrosive burns, if not properly handled during removal. Note: The largest remaining inventory is anticipated to be the back-up diesel fuel but a spill of this will not have direct consequence to people, see fire scenario above or firewater below. Worst credible consequence: A single fatality or sever injury to a worker undertaking dismantling tasks impacted by residual corrosive or asphyxiants.	The Site Licensee will prioritise the removal of chemicals and fuels from the site as early as possible to allow safe decommissioning. Method statements for the identification and safe removal of all hazardous substances will be developed as the Proposed Works progress. The Site Licensee will maintain a Safety Management System for the full life of the Proposed Works. The SMS will be maintained to the same standard as currently implemented for complying with the COMAH Regulations. The SMS will incorporate the principals of the Health and Safety at Work etc. Act 1974 and require: The hierarchy of controls to be embedded in the design where inherently safer options are selected wherever practicable. All activities will be subject to a suitable and sufficient risk assessment considering the impacts on people and the environment. The residual risk of harm from all activities will be reduced to As Low As Reasonably Practicable (ALARP). The approach to the Proposed Works will be designed to reduce the risk so far as is practicable and then further preventative and control measures will be implemented to achieve ALARP. These additional measures will include: The decommissioning of the surface water drainage, bunding and containment, and any other safeguards will be assessed against the ongoing risk of major accidents, and the residual risk will be maintained at a level that is ALARP, throughout the duration of the proposed works. Emergency response procedures will consider the potential for releases of hazardous materials and will define the actions to be taken to minimize the risk arising from potential releases. Emergency response procedures will consider the potential for releases of hazardous materials and will define the actions to be taken to minimize the risk arising from potential releases.	Preparations for Quiescence, Final Site Clearance	Medium	Very small chance of occurring	Not Significant

Scoped in scenario	Potential impact on receptors (worst case)	Embedded measures	Relevant Phases of the Project	Severity	Likelihood	Significance
	Land receptors A spill of hazardous chemicals or fuels not regulated by COMAH could be caused by a variety of factors including corrosion, human error or fire. The most likely release pathway is entrained in firewater. The worst case inventory is anticipated to be diesel fuel. Worst case consequence: A release of contaminated firewater contaminates the non-designated land on the site requiring clean up. It is anticipated that clean up can be achieved within two years.	All of the measures above will also apply to land receptors. Additionally, the site will maintain an effective emergency response plan to prevent the contamination of land.	Preparations for Quiescence, Final Site Clearance	Not MA&D	N/A	Not Significant
	Water receptors. A spill of hazardous chemicals or fuels not regulated by COMAH could be caused by a variety of factors including corrosion, human error or fire. The most likely release pathway is entrained in firewater. Worst credible consequence: Contaminated firewater with significant volume of hydrazine or diesel, if released overland, could impact the adjacent Southannan Sands SSSI. If released via the surface water drainage, then it could impact the marine receptor leading to serious damage across a wide area of the coastal marine environment potentially impacting >200 ha of littoral environment. Based upon the Energy Institute guidance, a Medium Term harm duration has been selected, which gives an overall severity of High	All inventories of hazardous substances will be removed from site other than hydrazine and diesel fuel prior to the start of PfQ. The Site Licensee will maintain a Safety Management System for the full life of the Proposed Works. The SMS will be maintained to the same standard as currently implemented for complying with the COMAH Regulations. The SMS will incorporate the principals of the Health and Safety at Work etc. Act 1974 and require: The hierarchy of controls to be embedded in the design where inherently safer options are selected wherever practicable. All activities will be subject to a suitable and sufficient risk assessment considering the impacts on people and the environment. The residual risk of harm from all activities will be reduced to As Low As Reasonably Practicable (ALARP). The approach to the Proposed Works will be designed to reduce the risk so far as is practicable and then further preventative and control measures will be implemented to achieve ALARP. These additional measures will include: The decommissioning of the surface water drainage, bunding and containment, and any other safeguards will be assessed against the ongoing risk of major accidents, and the residual risk will be maintained at a level that is ALARP, throughout the duration of the proposed works. Emergency response procedures will consider the potential for releases of hazardous materials and will define the actions to be taken to minimize the risk arising from potential releases.	Preparations for Quiescence, Final Site Clearance	High	Very small chance of occurring	Not Significant

Scoped in scenario	Potential impact on receptors (worst case)	Embedded measures	Relevant Phases of the Project	Severity	Likelihood	Significance
Run-off of contaminated fire water from non-process/non-rad fire/explosion (e.g., building fires) associated with the Proposed Works.	Land and Water receptors. A building fire on site would be tackled with local and portable firefighting equipment. There is the potential for some firewater to contain combustion products but should not contain any significant chemical or fuel inventory (see scenario above) Worst credible consequence: Contaminated firewater, if released overland, could impact the adjacent Southannan Sands SSSI but the area affected would be limited and short term. If released via the surface water drainage, then it could impact the marine receptor but the area affected would be limited and short term.	The Site Licensee will maintain a Safety Management System for the full life of the Proposed Works. The SMS will be maintained to the same standard as currently implemented for complying with the COMAH Regulations. The SMS will incorporate the principals of the Health and Safety at Work etc. Act 1974 and require: The hierarchy of controls to be embedded in the design where inherently safer options are selected wherever practicable. All activities will be subject to a suitable and sufficient risk assessment considering the impacts on people and the environment. The residual risk of harm from all activities will be reduced to As Low As Reasonably Practicable (ALARP). The approach to the Proposed Works will be designed to reduce the risk so far as is practicable and then further preventative and control measures will be implemented to achieve ALARP. These additional measures will include: The decommissioning of the surface water drainage, bunding and containment, and any other safeguards will be assessed against the ongoing risk of major accidents, and the residual risk will be maintained at a level that is ALARP, throughout the duration of the proposed works. Emergency response procedures will consider the potential for releases of hazardous materials and will define the actions to be taken to minimize the risk arising from potential releases.	Preparations for Quiescence, Final Site Clearance	Not MA&D	N/A	Not Significant
Major accidents caused by physical effects associated with the Proposed Works, (structural collapse, impact, dropped or swung load, high energy pipe/equipment failure, collapse of excavation).	Human population receptors The Proposed Works will require a significant amount of construction and demolition with associated earthworks. These works will require the use of significant heavy plant vehicles, lifting equipment and temporary structures which are well recognised hazards in the demolition industry. The most recent example was the 2016 boiler house collapse at Didcot A which led to four fatalities, five injured and over 50 medical treatment cases. Worst credible consequence: A collapse of one of the buildings or voids during preparation for demolition is considered to be the worst case with the potential for a high number of fatalities (10-100) and additional medical treatment cases.	All of the Proposed Works will be undertaken within the Works Area and this will be physically segregated from third party populations and any sensitive receptors. All of the Proposed Works will be managed and comply with a Construction Management Plan and relevant regulations such as the Construction (Design and Management) Regulations 2015 (CDM). The Site Licensee will maintain a Safety Management System for the full life of the Proposed Works. The SMS will be maintained to the same standard as currently implemented for complying with the COMAH Regulations.	Preparations for Quiescence and FSC	High	Very small chance of occurring	Not Significant

Scoped in scenario	Potential impact on receptors (worst case)	Embedded measures	Relevant Phases of the Project	Severity	Likelihood	Significance
	Historic environmental receptors Given the distance between the Proposed Works and the receptors it is not considered credible that a physical accident on site could damage an historic environment receptor sufficiently to lead to a loss of classification.	The SMS will incorporate the principals of the Health and Safety at Work etc. Act 1974 and require: The hierarchy of controls to be embedded in the design where inherently safer options are selected wherever practicable. All activities will be subject to a suitable and sufficient risk assessment considering the impacts on people and the environment. The residual risk of harm from all activities will be reduced to As Low As Reasonably Practicable (ALARP). The approach to the Proposed Works will be designed to reduce the risk so far as is practicable and then further preventative and control measures will be implemented to achieve ALARP. These additional measures will include: The majority of the deplanting operations will involve the use of the existing pile cap lifting and moving equipment. it is assumed that these items will be adequately maintained and inspected in accordance with normal EDF Energy procedures at all times during the deplanting process. Operation of this equipment by appropriately SQEP and trained operators will ensure that risks are minimised. A structural survey will be undertaken before commencement of dismantling operations. Furthermore, the dismantling has been designed to minimise the risks associated with structural failure (e.g., of support systems). Emergency response procedures will consider the potential for physical accidents during the Proposed Works and will define the actions to be taken to minimize the risk arising from such events.	Preparations for Quiescence and Final Site Clearance	Not MA&D	N/A	Not Significant
Natural disasters where the Proposed Works have a material effect on the extent and severity of the disaster.	Human population receptors The potential effects of flooding are considered in **Chapter 11: Surface water and flood risk**. A significant seismic incident affecting the Proposed Works leading to a loss of life is not considered to be credible. The design of the project will account for all foreseeable loads with due consideration of the changes due to Climate Change including wind speeds, precipitation, drought, extreme high/low temperatures. No risk of a direct fatality has been identified	The design of the Proposed Works will make due allowance for the effects of climate change altering the environmental conditions and loads in which the works may be carried out including consideration of wind, temperature, precipitation, flooding, and drought etc. All inventories of hazardous substances will be removed from site other than hydrazine and diesel fuel prior to the start of PfQ.	Preparations for Quiescence, Final Site Clearance	Not MA&D	N/A	Not Significant

Scoped in scenario	Potential impact on receptors (worst case)	Embedded measures	Relevant Phases of the Project	Severity	Likelihood	Significance
	Water and Land Receptors Potential flooding of area leading to contamination of water supply/ ground conditions of site. There will be some remaining inventories of diesel fuel and hydrazine into the PfQ phase which could be released in a worst case flood event. The consequences have been assessed based upon the risk from the operational station which is considered to be conservative. Worst credible consequence: Contaminated firewater with significant volume of hydrazine or diesel, if released overland, could impact the adjacent Southannan Sands SSSI. If released via the surface water drainage, then it could impact the marine receptor leading to serious damage across a wide area of the coastal marine environment potentially impacting >200 ha of littoral environment. Based upon the Energy Institute guidance, a Medium Term harm duration has been selected, which gives an overall severity of High	The Site Licensee will prioritise the removal of chemicals and fuels from the site as early as possible to allow safe decommissioning. The Site Licensee will maintain a Safety Management System for the full life of the Proposed Works. The SMS will be maintained to the same standard as currently implemented for complying with the COMAH Regulations. The SMS will incorporate the principals of the Health and Safety at Work etc. Act 1974 and require: The hierarchy of controls to be embedded in the design where inherently safer options are selected wherever practicable. All activities will be subject to a suitable and sufficient risk assessment considering the impacts on people and the environment. The residual risk of harm from all activities will be reduced to As Low As Reasonably Practicable (ALARP). The approach to the Proposed Works will be designed to reduce the risk so far as is practicable and then further preventative and control measures will be implemented to achieve ALARP. These additional measures will include: Access to reliable meteorological forecasting services to inform work planning and controls to prevent undertaking works in inappropriate conditions such as heavy crane lifts in high winds. The decommissioning of the surface water drainage, bunding and containment, and any other safeguards will be assessed against the ongoing risk of major accidents, and the residual risk will be maintained at a level that is ALARP, throughout the duration of the proposed works. Emergency response procedures will consider the potential for releases of hazardous materials and will define the actions to be taken to minimize the risk arising from potential releases. Emergency response procedures will consider the potential for significant weather events or other natural hazards and will define the actions to be taken to minimize the risk arising from these events.	Preparations for Quiescence, Quiescence, Final Site Clearance	High	Remote chance of occurring	Not significant
Major accidents caused by events external to the decommissioning where the Proposed	Human population receptors A major accident occurring at the adjacent HNA site during their Preparation for Care and Maintenance phase (until 2030) is unlikely to cause any serious harm to	The Site Licensee will maintain a Safety Management System for the full life of the Proposed Works. The SMS will be maintained to the same	Preparations for Quiescence, Quiescence, Final Site Clearance	Not MA&D	N/A	Not Significant

Scoped in scenario	Potential impact on receptors (worst case)	Embedded measures	Relevant Phases of the Project	Severity	Likelihood	Significance
Works have a material effect on the extent and severity of the accident	receptors associated with the Proposed Works during the Preparations for Quiescence phase. If an accident were to occur during the Final Site Clearance of HNA, then the Proposed Works would be in the Quiescence phase with minimal or no receptors which could be impacted. No MA&D potential identified. There are some industrial activities in the vicinity of the Works Area, especially around the Hunterston Port area, an accident at one of these facilities is not likely to extend significantly beyond the boundaries of these facilities. This means that it is extremely unlikely that an accident on one of these sites could lead to a major accident, either by directly impacting people or by initiating a domino accident. No MA&D potential identified. The design of the Proposed Works will account for the potential loss of utilities e.g. power and communications. The majority of process systems will be regulated by the Nuclear Safety Case or COMAH Regulations and will therefore be out of scope. All systems will be designed to fail safe and therefore loss of utilities should not lead to a major accident. The potential for an external hazard such as a plane crash to impact directly on the Proposed Works workforce is so low, it is not considered a credible major accident.	standard as currently implemented for complying with the COMAH Regulations. The SMS will incorporate the principles of the Health and Safety at Work etc. Act 1974 and require: The hierarchy of controls to be embedded in the design where inherently safer options are selected wherever practicable. All activities will be subject to a suitable and sufficient risk assessment considering the impacts on people and the environment. The residual risk of harm from all activities will be reduced to As Low As Reasonably Practicable (ALARP). The approach to the Proposed Works will be designed to reduce the risk so far as is practicable and then further preventative and control measures will be implemented to achieve ALARP. These additional measures will include: The Site Licensee will review all planning applications in the vicinity of the Proposed Works and object to any proposed development which would lead to a significant increase in risk at the Works Area. The Site Licensee will liaise with other local businesses and the local authorities to identify any potential hazards which arise over the course of the Proposed Works. Emergency response procedures will consider the potential for external hazards or threats and will define the actions to be taken to minimize the risk arising from these events.				
	Water and Land Receptors Potential damage and contamination of land and water supply on the site from external hazard, potential delay to operation. The potential for an external hazard such as a plane crash to impact directly on the Proposed Works workforce is so low, it is not considered a credible major accident. No credible major accident scenarios identified..		Preparations for Quiescence, Quiescence, Final Site Clearance	Not MA&D	N/A	Not Significant
	Historic environment receptors No credible major accident scenarios identified.		Preparations for Quiescence, Quiescence, Final Site Clearance	Not MA&D	N/A	Not Significant

19.

Coventional Waste

Appendix 19A: Materials and Resource Use

19B Material and resource use

19B.1 Introduction

19B.1.1 This Appendix relating to material and resource use has been prepared in direct response to the Office for Nuclear Regulation's (ONR) Pre-Application Opinion (PAO), adopted 04 October 2022.

19B.1.2 Specifically, paragraphs 125 and 126 of the PAO stated:

"There are some potential topics that do not appear to have been considered (or considered sufficiently) in the scoping report. The topics include:

- *Material and resources use*

It may be that these topic areas have already been scoped out of the assessment but that this has not been clearly stated. However, ONR considers that EDFE should consider whether these topics need to be included within the scope."

19B.1.3 As subsequent technical note (see **Appendix 5B**) was produced to outline whether material and resource use, amongst other scope items would be covered in the Environmental Statement or if they were scoped out. The finding of this additional scoping activity was to precautionarily scope Material and Resource use into the HNB EIADR Environmental Statement.

19B.1.4 With this in mind, this Appendix, which has been prepared as supplementary to **Chapter 19: Conventional Waste**, seeks to consider the potential impact of the type and quantity of raw materials required because of the Proposed Works. Specifically, the focus of this assessment is on evaluating the level of burden that the Proposed Works would place on local/ regional sources of raw building materials, with established landbanks for different materials representing the assessed receptors.

19B.2 Relevant legislation, policy and technical guidance

19B.2.1 Legislation, policy and technical guidance relevant to this material and resource use assessment is presented in **Chapter 19: Conventional Waste**.

Scope of this assessment

19B.2.2 This assessment considers the extent to which the Proposed Works places a burden on local/ regional sources of raw building materials at each of the Proposed Works three key phases (as described in **Chapter 2: The Decommissioning Process**):

- Preparation for Quiescence phase;
- Quiescence phase; and
- Final Site Clearance.

19B.2.3 The Preparation of Quiescence phase will require supplies of raw materials – specifically for the construction works required for the completion of the Safestore. For this reason, this phase of the Proposed Works is included in this assessment of materials.

19B.2.4 However, as the Quiescence phase and the Final Site Clearance phase will not require significant supplies of raw building materials – as essentially these stages represent a 'dormant' 70-year period followed by the removal of any final structures – it is not considered necessary to assess the effects of these phases' effects on material assets. Whilst very small quantities of construction materials will be required during these phases for example, for routine maintenance and repairs, the amounts are likely to be negligible and therefore not expected to have any significant adverse effects.

19B.2.5 With the above points in mind, this assessment focuses on the material and resource asset effects of the Preparation for Quiescence phase only.

19B.3 Data gathering methodology

Study area

19B.3.1 The Study Area for the materials assessment focuses on the administrative area of the appropriate Minerals Planning Authority (WPA)– in this case, North Ayrshire Council (NAC). It also extends beyond that into an expansive study area which to considers the availability of construction materials within the West Central Scotland and Dumfries & Galloway regional area.

Desk study

19B.3.2 The materials assessment has been undertaken with reference to **Chapter 2: The Decommissioning Process**, supported by a number of data sources. The principal data sources used to inform this Appendix comprise:

- North Ayrshire LDP20[1] and its supporting evidence;
- Scottish Aggregates Levy data, published by Scottish Government (August 2020)[2];
- British Geological Society (2020) *Directory of Mines and Quarries* [Online][3];
- Scottish Government (2015) *Scottish Aggregates Survey 2012*. [Online][4]; and
- British Geological Society (2019) *Mineral Planning Factsheet Construction aggregates*. [Online][5].

Data limitations

19B.3.3 The assessment baseline uses the most recent available published data, which is up to and including 2020 (unless stated otherwise). Future trends are not available for scrutiny and are – at the time of publication – generally accepted to be relatively unpredictable (particularly with supply chain impacts resulting from COVID-19 or the UKs departure from the EU).

19B.3.4 In terms of data relating to the consumption of material assets by the Proposed Works, specifically in respect of the construction and cladding of the Safestore, detailed quantitative information on the tonnage of material requirements is not yet available. A partially qualitative assessment has therefore been carried out in respect of this aspect of the Proposed Works, which has drawn upon relevant design information, as appropriate.

[1] North Ayrshire Council (2020). *North Ayrshire Local Development Plan (LDP20)*. Available online: https://www.north-ayrshire.gov.uk/Documents/CorporateServices/LegalProtective/LocalDevelopmentPlan/ldp2.pdf. Accessed 03 August 2023.
[2] Evidence Review and Illustrative Policy Options for a Scottish Aggregates Levy: Final Report (August 2020). Available online: https://www.gov.scot/binaries/content/documents/govscot/publications/research-and-analysis/2020/08/evidence-review-illustrative-policy-options-scottish-aggregates-levy/documents/evidence-review-illustrative-policy-options-scottish-aggregates-levy-final-report/evidence-review-illustrative-policy-options-scottish-aggregates-levy-final-report/govscot%3Adocument/evidence-review-illustrative-policy-options-scottish-aggregates-levy-final-report.pdf. Accessed 03 August 2023.
[3] British Geological Society. 2020. *Directory of Mines and Quarries*. [Online]. [Accessed: 03/10/2023]. Available at: https://www2.bgs.ac.uk/mineralsuk/download/dmq/Directory_of_Mines_and_Quarries_2020.pdf
[4] Scottish Government. 2015. *Scottish Aggregates Survey 2012*. [Online]. [Accessed: 03/10/2023]. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/statistics/2015/06/scottish-aggregates-survey-2012/documents/00479064-pdf/00479064-pdf/govscot%3Adocument/00479064.pdf
[5] British Geological Society. 2019. *Mineral Planning Factsheet Construction aggregates*. [Online]. [Accessed: 03/10//2023]. Available at: https://www2.bgs.ac.uk/mineralsuk/download/planning_factsheets/mpf_aggregates.pdf

Survey work

19B.3.5 The materials impact assessment has been based upon published data sources only and has not necessitated the carrying out of any survey work.

19B.4 Assessment methodology

19B.4.1 The proposed generic project-wide approach to the assessment methodology is set out in **Chapter 5: The EIA Process**, and specifically in **Section 5.3** and **Section 5.4**. However, whilst this has informed the approach that has been used in this material assets appendix, it is necessary to set out how this methodology will be applied, and adapted as appropriate, to address the specific needs of the waste and material assets assessment in the ES.

General approach

19B.4.2 The Institute of Environmental Management and Assessment (IEMA) (2020), *Guide to Materials and Waste in EIA*[6] (hereinafter referred to as the IEMA Guide) has been used to assess the potential impacts and effects from the Proposed Development, using the process and significance criteria it sets out. In accordance with the IEMA Guide, the assessment is a quantitative exercise that aims to identify the type and volume of materials to be consumed by the Proposed Works, including details of any recycled materials content.

19B.4.3 The sensitive receptors incorporated into the assessment are essentially supplies of material assets – the consumption of which adversely impacts on their immediate and long-term availability, resulting in depletion of natural resources.

19B.4.4 The sensitivity of materials relates to the regional (and where justified, national) availability and type of resources to be consumed by the Proposed Works.

19B.4.5 The magnitude of impacts from the Proposed Works that have been considered in the assessment relate to anticipated reductions in availability (stocks, production and/or sales) of materials regionally and, where appropriate, nationally.

19B.4.6 The likely types and estimated quantities of material resources required for the Proposed Works have been assessed. Impacts and effects have been evaluated against data for the regional and (where appropriate) national materials markets, where information is available.

Significance criteria

19B.4.7 The criteria for assessing sensitivity of materials are set out in **Table 19B.1**. The information provided is based on Section 10.2 of the IEMA Guide. The sensitivity of materials will be determined by identifying where one or more of the criteria from the following thresholds are met.

[6] Institute of Environmental Management and Assessment (IEMA) (2020), Guide to Materials and Waste in EIA.

Table 19B.1 Materials sensitivity criteria

Sensitivity	Materials criteria
Negligible	*"The key materials required for the construction of the Proposed Works are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock;* *and / or* *… are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials."*
Low	*"The key materials required for the construction of the Proposed Works are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock*."
Medium	*"The key materials required for the construction of the Proposed Works are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock."*
High	"*The key materials required for the construction of the Proposed Works are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock*."
Very high	"*The key materials required for the construction of the Proposed Works are known to be insufficient in terms of production, supply and / or stock*."

19B.4.8 **Table 19B.2** sets out the criteria for assessing the magnitude of impact on materials and waste. The table articulates information set out in Section 10.3 of the IEMA Guide.

Table 19B.2 Materials magnitude of change

Magnitude	Materials criteria
No change	*"No materials are required."*
Negligible	*"No individual material type is equal to or greater than 1% by volume of the regional (or where justified national) baseline availability."*
Minor	*"One or more materials is between 1-5% by volume of the regional (or where justified, national) baseline availability;* *and / or* *the development has the potential to adversely and substantially impact access to one or more allocated mineral site (in their entirety), placing their future use at risk.* *The level of impact is justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed."*

Magnitude	Materials criteria
Moderate	*"... one or more materials is between 6-10% by volume of the regional (or where justified, national) baseline availability;* *and / or* *one allocated mineral site is substantially sterilised by the development rendering it inaccessible for future use.* *The level of impact is justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed."*
Major	*"One or more materials is >10% by volume of the regional (or where justified, national) baseline availability;* *and / or* *more than one allocated mineral site is substantially sterilised by the development rendering it inaccessible for future use.* *The level of impact is justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed."*

Effects of significance

19B.4.9 In accordance with Section 11 of the IEMA Guide, the significance of effects on materials will be determined by comparing sensitivity and magnitude using the matrix provided in **Table 19B.3**.

Table 19B.3 Materials magnitude of change

	Negligible sensitivity	Low sensitivity	Medium sensitivity	High sensitivity	Very high sensitivity
No change in magnitude	Neutral	Neutral	Neutral	Neutral	Neutral
Negligible change in magnitude	Neutral	Neutral or slight	Neutral or slight	Slight	Slight
Minor change in magnitude	Neutral or slight	Neutral or slight	Slight	Slight or **moderate**	**Moderate or large**
Moderate change in magnitude	Neutral or slight	Slight	**Moderate**	**Moderate or large**	**Large or very large**
Major change in magnitude	Slight	Slight or **moderate**	**Moderate or large**	**Large or very large**	**Very large**

19B.4.10 Effects that are classified as moderate, large or very large are considered to be significant, for materials (noted in bold text in **Table 19B.3**). Effects classified as slight or neutral are not significant.

19B.5 Baseline conditions

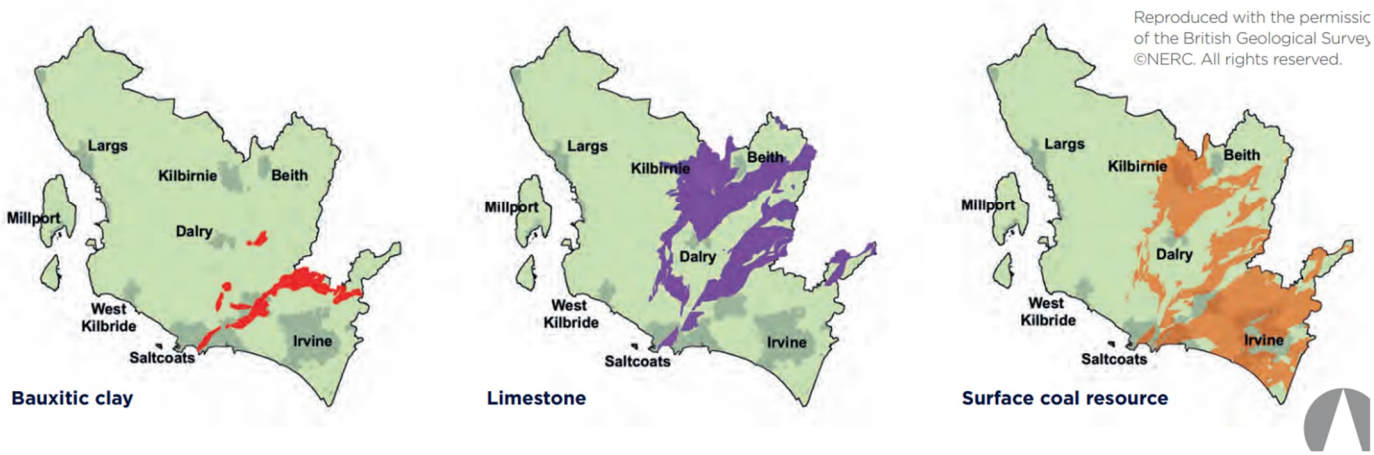
Current baseline conditions

19B.5.1 The Proposed Works fall within the unitary planning authority area of North Ayrshire Council, which is the statutory body responsible for the management and delivery of mineral planning applications and development in line with national targets[7].

[7] Local mineral planning authorities are required to ensure there is a sufficient landbank and supply of aggregates (limestone, clay, rock, sand and gravel) over at least a 10-year period at all times in relevant market areas. In Scotland, National Planning Policy requires Local Development Plans to support the extraction of mineral and the maintenance of permitted reserves in accordance with national policy, however there is no national mechanism to provide an overall assessment of future construction aggregates.

19B.5.2 **Graphic 19B.1** shows deposits of existing mineral resource across North Ayrshire. Allied to this, the North Ayrshire Local Development Plan (LDP) (adopted 2019) [8] states that there are no economically viable mineral resources within the Works Area or any safeguarded mineral areas within the local planning authority area. In this regard, the Proposed Works will not sterilise any significant / economically viable mineral deposits.

Graphic 19B.1 Deposits of existing mineral resource across North Ayrshire



19B.5.3 Whist the LDP contains policies to support mineral planning applications, supporting evidence such as monitoring reports indicating the supply of material assets is either not available or largely out of date.

19B.5.4 The latest national survey of Scottish aggregates resources was conducted in 2012[9] within the British Geological Survey (BGS) Mineral Planning Factsheet[10]. The collation of results on consented reserves is considered on a regional level and North Ayrshire falls within the West Central Scotland B and Dumfries & Galloway regional area. **Table 19B.4** shows estimated reserves in active sites in 2012. It also shows an active quarry within this area for sand and gravel, except this information is preserved for confidentiality.

[8] North Ayrshire Council. 2019. *Adopted Local Development Plan*. [Online]. [Accessed: 03/10/2023]. Available at: https://www.north-ayrshire.gov.uk/Documents/CorporateServices/LegalProtective/LocalDevelopmentPlan/ldp2.pdf
[9] Scottish Government. 2015. *Scottish Aggregates Survey 2012*. [Online]. [Accessed: 03/10/2023]. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/statistics/2015/06/scottish-aggregates-survey-2012/documents/00479064-pdf/00479064-pdf/govscot%3Adocument/00479064.pdf
[10] British Geological Society. 2019. *Mineral Planning Factsheet Construction aggregates*. [Online]. [Accessed: 03/10/2023]. Available at: https://www2.bgs.ac.uk/mineralsuk/download/planning_factsheets/mpf_aggregates.pdf

Table 19B.4 Estimated consented aggregate reserves in active sites in Scotland

Region	('000 tonnes)		
	Sand & Gravel	Crushed Rock	Total
Argyll and Bute	S	S	S
Forth Valley	S	0	S
Highland and Moray	5,430	23,205	28,635
Northeast Scotland	4,151	240,792	244,943
Orkney and Shetland Islands	0	S	S
SESplan	16,768	21,809	38,577
TAYplan	10,460	17,193	27,653
West Central Scotland A	18,791	81,627	100,418
West Central Scotland B and Dumfries and Galloway	S	18,131	S
Western Isles	123	2,770	2,893
Total	**60,842**	**410,427**	**471,269**

S = suppressed to preserve confidentiality

19B.5.5 Notwithstanding the time that has passed since the publication of the data provided in **Table 19B.4**, the data does indicate that sand and gravel and crushed rock aggregates are available across many regions in Scotland and that supply is not restricted.

19B.5.6 Data from the BGS in 2020[11] indicates several mineral operators across Scotland (from 2019). It also shows a number of operators working within North Ayrshire (see **Table 19B.5**), which suggests raw aggregates and mineral (limestone, crushed rock, silica sand, clay, sand and gravel) is available and can be sourced locally.

Table 19B.5 Mineral operators and raw aggregates/minerals extracted in the North Ayrshire Council area

Operator	Name of working	Commodity
Breedon Northern	Swinless Quarry	Igneous and Metamorphic Rock
Hugh King and Co.	Garnock West Quarry	Sand
Hugh King and Co.	Hullerhill Sand Quarry	Silica Sand
Leith's (Scotland) Ltd.	Trearne Quarry	Limestone
W H Malcolm Ltd.	Loanhead Quarry	Igneous and Metamorphic Rock
John Thomson Construction Ltd.	Bogary Quarry	Igneous and Metamorphic Rock
John Thomson Construction Ltd.	Dereneneach Quarry	Igneous and Metamorphic Rock
John Thomson Construction Ltd.	Mid Sannox Quarry	Sand and Gravel

[11] British Geological Society. 2020. *Directory of Mines and Quarries*. [Online]. [Accessed: 03/10/2023]. Available at: https://www2.bgs.ac.uk/mineralsuk/download/dmg/Directory_of_Mines_and_Quarries_2020.pdf

Operator	Name of working	Commodity
Smith Skip Ltd.	Knowes Farm Clay Pit	Clay and Shale

19B.5.7 Whilst there is no recent data to demonstrate how much economically viable mineral reserve is available in North Ayrshire, data from the BGS (and more historic information published by Scottish Government) indicate that a variety of primary aggregates and mineral sites that are available in the region within which North Ayrshire sits. Allied to this, there is data which sets out sales of material assets in Scotland as set out in the Monthly Bulletin of Building Materials and Components – August 2023[12]. **Table 19B.6** summarises this sales data.

Table 19B.6 Sales of construction aggregates in Scotland (2019)

Region	Sales in 2022 ('00 tonnes)		
	Sand & gravel	**Crushed rock**	**Total**
South of Scotland	425	1,879	2,304
North-East Scotland	493	2,300	2,793
Highlands	622	7,720	8,342
Islands Areas	c	c	c
East Central Scotland	c	1,707	1,707*
West Central Scotland	1,879	4,455	6,334
Tayside and Fife	1,431	1,155	2,586

[12] Scottish Aggregates Levy: evidence review and policy options, Scottish Government (August 2020) Appendix 6: Additional Tables on the Analysis of the Scottish Aggregates Market - Scottish Aggregates Levy: evidence review and policy options - gov.scot (www.gov.scot) [Accessed online on 05/10/23]

Region		Sales in 2022 ('00 tonnes)	
Scotland Total	**5,396**	**19.759**	**24,076***

c – confidential data

*- excludes confidential amounts

19B.5.8 In terms of non-aggregate materials such as steel and aluminium, data relating to supplies is available, but only relates to the national picture rather than a regional one. In respect of steel, UK production in 2021 was 7.2 million tonnes[13]. Steel is used in construction for a range of purposes, but most notably to provide robust super-structures and support for buildings.

19B.5.9 For aluminium, the national Aluminium Federation reports that there are two smelters in the UK – a 43,000 tonnes per annum facility in the Scottish Highlands and a larger, 180,000 tonnes per annum facility in Lynemouth in Northumberland[14]. Aluminium is a lightweight metal produced and traded on a global scale, with diverse applications in construction, including for cladding, roofing and guttering. It is also highly recyclable and plays and increasingly key role in the UK's transition to a more sustainable future.

Future baseline

19B.5.10 Irrespective of the Proposed Works, there are unlikely to be any notable changes to the existing material assets baseline and future consumption rates both in North Ayrshire and regionally.

19B.6 Embedded environmental measures

19B.6.1 There are no embedded environmental measures.

19B.7 Assessment of potential effects

19B.7.1 The Proposed Works fundamentally comprise the dismantling and deconstruction of buildings and structures within the Works Area during the Preparation for Quiescence phase. However, the Proposed Works also involve the modification of the reactor building into a Safestore. In this regard, it is anticipated that materials (aggregates/mineral) will be required or imported to the Site for these purposes.

[13] StatsWales (2023), Iron and Steel Production by Year, Measure and Area. Available at: https://statswales.gov.wales/Catalogue/Business-Economy-and-Labour-Market/Economic-Indices/Indices-of-Production-and-Construction/ironandsteelproduction-by-year-measure-area. Accessed online on 03 October 2023.
[14] UK Aluminium Industry Fact Sheet 17 *Primary Aluminium Production.* Available at: 17-aluminium-primary-production.pdf (alfed.org.uk). Accessed online on 03 October 2023.

19B.7.2 It is intended to re-use rubble generated from the demolition activities required for the Proposed Works in both the Preparations for Quiescence (a duration of 12 years) and Final Site Clearance phases as across the whole decommissioning lifecycle, the site could potentially achieve an approximate cut/fill balance as outlined in **Chapter 3 - Alternatives**. However, this would require the retention of voids on-site through the quiescence phase which may still prove to not be practicable. With this in mind, this assessment will consider the worst case that import of fill material during the Preparations for Quiescence phase is required so that voids don't need to be retained through the Quiescence phase.

19B.7.3 Whilst EIADR must consider the full duration of the decommissioning proposals, the impact on Material Resources is anticipated to be highest during the Preparations for Quiescence phase. Very little works are anticipated during the quiescence phase and likely significant effects during this phase can therefore be scoped out. During Final Site Clearance, the lack of infill materials that will be required to be imported to site in any eventuality, and the material requirements for the construction of the Waste Management Centre being highly likely to be lower than those for the modification of the Safestore because of the difference in scale of the two structures allows a proxy assessment to be undertaken in B1.8 below.

Material resources

19B.7.4 Approximately ~17,210 tonnes of clean rubble derived from demolition within the Works Area will be utilised on site as fill material. This re-use of onsite material will substitute a proportion of the currently anticipated imported fill material requirements, which in total amounts to approximately 89,170 tonnes in total.

19B.7.5 Key (indicative) bulk construction material required for the Proposed Works are set out in **Table 19B.7**. Data is based on the current design estimates and has been rounded up to the nearest 10 tonnes or square metres.

Table 19B.7 indicative bulk material resources required for the Preparation for Quiescence phase

Material type	Estimated quantity	Use of material in Proposed Works	Consumption compared to baseline
Aggregates	71,690* tonnes (using a conversion factor of 0.6m^3 = tonne)	Fill material	0.4% of North Ayrshire consented primary aggregate reserves; and 1.1% of the 2019 West Central Scotland aggregates sales.
Safestore:			
Vertical Cladding	10,115m^2	Construction and cladding of the Safestore.	See text in paragraph 18B.8.6.
Façade structure/ infill and re-enforcement	3,230 m^2	Construction and cladding of the Safestore.	See text in paragraph 18B.8.6.
Roofing	7,130 m^2	Construction and cladding of the Safestore.	See text in paragraph 18B.8.6.
Steelwork (for roof)	7,130 m^2	Construction and cladding of the Safestore.	See text in paragraph 18B.8.6.
Foundation pads	80 m^2	Construction and cladding of the Safestore.	Refer to aggregates.
Strip footings	600 m^2	Construction and cladding of the Safestore.	Refer to aggregates.
Protection wall	3,780 m^2	Construction and cladding of the Safestore.	Refer to aggregates.

Material type	Estimated quantity	Use of material in Proposed Works	Consumption compared to baseline
Masonry face and insulation	3,780 m^2	Construction and cladding of the Safestore.	For masonry face refer to aggregates. For insulation, any comparison with the baseline has not been possible as there is no data relating to the availability of building insulation.

*This figure has been calculated by taking the available clean rubble that will remain onsite (17,210 tonnes) away from the total aggregate requirements for fill (89,170 tonnes).

19B.7.6 The data presented in **Table 19B.4** indicates that aggregates are readily available locally and regionally. It is also known that there will be on-site material available for re-use as fill material, which will temper the requirements for materials being brought into the Site.

19B.7.7 For those elements of the Proposed Works which will require supplies of steel and/ or aluminium i.e. vertical Cladding (façade structure/ infill and re-enforcement, roofing steelwork (for roof) etc., data presented in **Section 19B.4** of this Appendix has demonstrated that both of these materials are in ready supply domestically and are produced and traded on a national and global scale. Allied to this, whilst it has not been possible to identify specific steel and aluminium quantities in tonnage terms, the material requirements of the Proposed Works are likely to represent a minor magnitude of material resource consumption. Using professional judgement to apply the criteria set out in **Table 19B.1**, the sensitivity of aggregate material resources is considered medium. Using the criteria set out in **Table 19B.2** and the supporting text above, the magnitude of material resource consumption considering the impact on mineral safeguarding areas is **minor**. The effects associated with material resource consumption (in accordance with **Table19B.3**) are slight and therefore **not significant**.

19B.7.8 Whilst not formally assessed, effects during the Final Site Clearance phase are likely to lead to a minor/negligible magnitude of resource consumption on the same medium sensitivity receptors. Effects in the Final Site Clearance phase are therefore anticipated to be Slight/neutral and therefore not significant.

19B.8 Summary

19B.8.1 **Table19B.8** provides a summary of the findings of the assessment.

Table 19B.8 Summary of material assets effects

Receptor	Potential effects	Significance of effects prior to mitigation	Additional mitigation	Residual effects	Monitoring
Preparation for Quiescence phase:					
Material resources	Depletion of material resources and sterilisation of mineral safeguarding areas. The sensitivity of material resources is considered medium and the magnitude of impact negligible/ minor.	Neutral/ slight adverse (not significant)	None	Neutral/ slight adverse (not significant)	Not applicable

21.

Cumulative Effects Assessment

Appendix 21A: Intra-project Screening Tables

Table 21A.1 Stage 3 intra-project screening table during Preparations for Quiescence phase

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Workers of Hunterston B power station	People and communities, transport, air quality, noise and vibration	Medium risk of dust emissions arising from demolition activities and low risk of dust emissions arising from construction activities associated with the Proposed Works (not significant). Minor adverse noise effects (not significant) arising from activities in the Works Area and road traffic noise. Changes in traffic flows as a result of decommissioning activities, however no significant traffic and transport effects have been identified. Major significant adverse effect arising from changes to employment in the local area with potentially variable periods of unemployment and associated mental health impacts.	Workers will wear appropriate personal protective equipment (PPE), with works managed to reduce potential health risks. There is a small increase in traffic arising from the Proposed Works, however this increase would be less than 10%. Combined dust, noise and traffic effects are thus unlikely to contribute to an increased sense of disturbance. It is expected the existing workers at HNB will reduce gradually during the Proposed Works. Whilst workers will experience changes in employment, this is unlikely to combine with the above-described effects, which will result in major significant effects. However, consideration of impacts associated with employment	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
			on local area is considered separately.	
Hunterston A station site workers	Traffic and transport, air quality, noise and vibration, landscape and visual	Up to moderate adverse effects (not significant) on landscape character and coastal character areas during Preparations for Quiescence phase. These effects would reduce towards the culmination of this phase. Major adverse visual effects (significant) on Power Station Road and Ayrshire Coastal Path during the Preparations for Quiescence phase. These effects would reduce towards the culmination of this phase. Medium risk of dust emissions arising from demolition activities and low risk of dust emissions arising from demolition activities and low risk from construction activities associated with the Proposed Works (not significant). Minor adverse noise effects (not significant) arising from activities in	There is the potential for combined effects arising from noise, air quality and the deterioration of visual and recreational amenity. However, due to the nature of the decommissioning works at HNA, workers will already wear appropriate personal protective equipment (PPE), and similar works would be managed to reduce potential health risks. If workers used adjacent recreational routes, access along the Ayrshire Coastal Path near the Site will be maintained throughout all phases of the Proposed Works. Due to local conditions (noise/dust) already experienced due to the decommissioning of HNA, users are unlikely to be further inconvenienced.	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
		the Works Area and road traffic noise. Changes in traffic flows as a result of decommissioning activities, however significant traffic and transport effects on have been identified.	Whilst there is a small increase in traffic arising from the Proposed Works, this increase would be less than 10%. Combined dust, noise and traffic effects are thus unlikely to contribute to an increased sense of disturbance.	
Rural communities in the vicinity of Hunterston B power station site	People and communities, transport, landscape and visual, air quality, noise and vibration	Up to moderate adverse effects (not significant) on landscape character and coastal character areas during Preparations for Quiescence phase. These effects would reduce towards the culmination of this phase. Major adverse visual effects (significant) on Power Station Road and Ayrshire Coastal Path during the Preparations for Quiescence phase which may be used by people from these communities. These effects would reduce towards the culmination of this phase. At other views, at greater distances from the Site (and more representative of views from the settlements of Fairlie and West Kilbride), effects would be	There is also the potential for combined effects arising from noise, air quality and the deterioration of visual and recreational amenity. While employee health may have benefited from stable employment, the effects of unemployment are significant within this postcode district. ties from the Ayrshire Growth Deal. Combined, these effects are likely to lead to an increased sense of disturbance and discontent within the communities.	Yes

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
		up to moderate (not significant) during the peak of the Preparations for Quiescence phase. Medium risk of dust emissions arising from demolition activities and low risk of dust emissions arising from demolition activities and low risk from construction activities associated with the Proposed Works (not significant). Minor adverse noise effects (not significant) arising from activities in the Works Area and road traffic noise. Changes in traffic flows as a result of decommissioning activities, however no significant traffic and transport effects on have been identified. Major significant adverse effect, at a very local level, associated with changes to employment in the local area with potentially variable periods of unemployment and associated mental health impacts.		

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Communities and residential receptors within Millport	Landscape and visual, noise and vibration, air quality	Noise levels during peak years of activity are predicted not to exceed the BS 5228-1 thresholds of significance. Minor adverse noise effects reported (with the impact itself being negligible), which are not significant. No decommissioning /construction traffic noise effects are anticipated. Visual effects arising from seeing the Proposed Works in views from Millport are anticipated to be neutral, moderate/minor and not significant. Residents within Millport are outside of the air quality assessment as effects are anticipated to be negligible, and no decommissioning /construction traffic associated with the Proposed Works will pass through the community.	Whilst noise sensitive receptors were considered within the assessment, residential receptors in Millport are outside the noise and vibration study area, and have been included within the assessment through consultation. The assessment presented in **Chapter 15: Noise and vibration** of the **ES** has identified that these receptors are not expected to experience significant effects. Views of the Proposed Works during the Preparations for Quiescence phase are considered to be neutral, and not significant. Overall it is considered there is limited potential for intra-project effects to arise on the community and residential receptors within Millport.	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Communities and residential receptors within Fairlie	People and communities, transport, landscape and visual, noise and vibration, air quality	Noise levels during peak years of activity are predicted not to exceed the BS 5228-1 thresholds of significance. Minor adverse noise effects reported (with the impact itself being negligible), which are not significant. In addition, minor adverse (not significant) effects as a result of decommissioning/construction traffic are anticipated. Visual effects arising from seeing the Proposed Works in views from Fairlie (represented by Viewpoint 10 in the landscape and visual impact assessment presented in **Chapter 14: Landscape and Visual Impact Assessment** of the ES, and associated view point analysis in **Appendix 14C**) are anticipated to be neutral, moderate/minor and not significant. Major adverse visual effects (significant) on Power Station Road and Ayrshire Coastal Path during the Preparations for Quiescence phase which may be used by people from these communities. These effects would	No significant noise effects are anticipated during the proposed activities being undertaken in this phase, as presented in **Chapter 15: Noise and vibration** of the ES. In addition, the preferred decommissioning / construction traffic routes do not pass through Farlie and therefore no significant traffic noise or traffic effects are anticipated. Effects of the Proposed Works in views from Fairlie during the Preparations for Quiescence phase are considered to be neutral, and not significant. Residents may use coastal paths which pass through the Works Area i.e. the Ayrshire Coastal Path, however access will be maintained throughout all phases of the Proposed Works. In addition, due to local conditions (noise/dust) already experienced due to the	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
		reduce towards the culmination of this phase. Residents within Fairlie are outside of the air quality assessment as effects are anticipated to be negligible. Major significant adverse effect, at a very local level, associated with changes to employment in the local area with potentially variable periods of unemployment and associated mental health impacts.	decommissioning of HNA, users are unlikely to be further inconvenienced. There is the potential for effects in the settlement arising from loss of employment and, while employee health may have benefited from stable employment. This context includes challenging localised socio-economic conditions, and geographic constraints. Overall it is considered there is limited potential for intra-project effects to arise on the community and residential receptors within Fairlie. The main effects, due to loss of employment are not likely to interact with other effects reported.	

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Communities and residential receptors within West Kilbride	People and communities, transport, landscape and visual, noise and vibration, air quality	Noise levels during peak years of activity are predicted not to exceed the BS 5228-1 thresholds of significance. Minor adverse noise effects reported (with the impact itself being negligible), which are not significant. In addition, minor adverse (not significant) effects as a result of decommissioning/ construction traffic are anticipated. Visual effects arising from seeing the Proposed Works in views from West Kilbride (represented by Viewpoint 9 in the landscape and visual impact assessment presented in **Chapter 14: Landscape and Visual Impact Assessment** of the ES, and associated view point analysis in **Appendix 14C**) are anticipated to be neutral, moderate/minor and not significant. Major adverse visual effects (significant) on Power Station Road and Ayrshire Coastal Path during the Preparations for Quiescence phase which may be used by people from these communities. These effects would	No significant noise effects are anticipated during the proposed activities being undertaken in this phase, as presented in Chapter 15 of the ES. Whilst the preferred decommissioning / construction traffic routes pass through West Kilbride and due to low volumes of traffic associated with the Proposed Works, no significant traffic noise effects are anticipated. Effects of the Proposed Works in views from West Kilbride during the Preparations for Quiescence phase are considered to be neutral, and not significant. Residents may use coastal paths which pass through the Works Area i.e. the Ayrshire Coastal Path, however access will be maintained throughout all phases of the Proposed Works. In addition, due to local conditions (noise/dust) already experienced due to the	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
		reduce towards the culmination of this phase. Residents within West Kilbride are outside of the air quality assessment as effects are anticipated to be negligible. Major significant adverse effect, at a very local level, associated with changes to employment in the local area with potentially variable periods of unemployment and associated mental health impacts.	decommissioning of HNA, users are unlikely to be further inconvenienced. There is the potential for effects in the settlement arising from loss of employment and, while employee health may have benefited from stable employment, the context includes challenging localised socio-economic conditions, and geographic constraints. Overall it is considered there is limited potential for intra-project effects to arise on the community and residential receptors within Fairlie. The main effects, due to loss of employment are not likely to interact with other effects reported.	

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Users of public rights of way, local walks and roads	People and communities, transport, landscape and visual, air quality, noise and vibration	Up to moderate adverse effects (not significant) on landscape character and coastal character areas during Preparations for Quiescence phase. These effects would reduce towards the culmination of this phase. Major adverse visual effects (significant) on Power Station Road and Ayrshire Coastal Path during Preparations for Quiescence phase. These effects would reduce towards the culmination of this phase. At other views, effects would be up to moderate (not significant) during the peak of this phase. Medium risk of dust emissions arising from demolition activities and low risk of dust emissions arising from demolition activities and low risk from construction activities associated with the Proposed Works (not significant). Minor adverse noise effects (not significant) arising from activities in	There is the potential for combined effects arising from noise, air quality and the deterioration of visual and recreational amenity. Combined, these effects are likely to lead to an increased sense of disturbance. Whilst there is a small increase in traffic arising from the Proposed Works, this increase has not warranted furtehr assessment due to the low likelihood to have significant effects. Traffic is therefore unlikely to contribute to an increased sense of disturbance.	Yes

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
		the Works Area and road traffic noise. Changes in traffic flows as a result of decommissioning activities, however significant traffic and transport effects on have been identified.		
Statutory and Non-Statutory Biodiversity Conservation Sites - Terrestrial	Terrestrial biodiversity and ornithology, air quality,	Dust and vehicle emissions can result in physical effects on vegetation where photosynthesis is reduced due to soiling of the vegetation surface, and there can be chemical effects on soils or watercourses depending on the composition of the dust. Increases in the baseline concentration of oxides of Nitrogen (NOx) and Ammonia (NH_3) in particular can lead to poorer plant growth, reduced productivity and eutrophication, which can damage sensitive habitats and biodiversity conservation sites.	The potential for intra-project cumulative effects on terrestrial Statutory and Non-Statutory Biodiversity Conservation Sites has already been considered within **Chapter 8: Terrestrial biodiversity and ornithology**. The assessment of dust emission reported within **Chapter 6: Air quality** has concluded that without appropriate mitigation measures applied, the highest risk of impact from dust emissions to ecological receptors (reported within **Chapter 6: Air quality, Table 6.17**) is 'Medium', and this is during demolition works associated with the Proposed	No.

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
			Works (as reported within **Chapter 6: Air quality, Table 6.22)**. However, as per the IAQM guidance, with effective mitigation measures applied, the residual effect from these dust emissions is not significant. Best practice measures have been proposed as an outcome of the dust assessment and are reported within **Chapter 6: Air quality, Table 6.14**. Southannan Sands Special Site of Special Scientific Interest (SSSI), Southannan Local Nature Conservation Sites (LNCS) and Kilruskin Wood LNCS is within 0.2 km of the ZoI from vehicle routes. However, the projected increase in traffic flows are unlikely to change the baseline concentrations of NOx or Ammonia at the SSSI by >1%. Further detail is included in	

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
			Chapter 8: Terrestrial biodiversity and ornithology.	
Statutory and Non-Statutory Biodiversity Conservation Sites - Marine	Marine biodiversity, water quality and surface water and flood risk	The discharge of water from the Site towards the offshore marine environment (Firth of Clyde), could result in reduced marine water quality and lead to degradation of designated sites.	The potential for intra-project cumulative effects on marine Statutory and Non-Statutory Biodiversity Conservation Sites has already been considered within **Chapter 9: Marine biodiversity**. Run-off from potentially contaminated land due to the demolition of land-based infrastructure will be controlled using standard site management practices and the risk of such run-off is thus considered to be low be low risk with the appropriate measures in place. However, through the implementation of the embedded measures outlined in this chapter and **Chapter 10: Coastal management and water quality** and **Chapter 12: Soils, geology and**	No.

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
			hydrogeology of the ES, it is considered that neither of the above potential intra-project effects would be significant.	
Habitats - Terrestrial	Terrestrial biodiversity and ornithology, air quality	The Proposed Works are mainly confined to hard standing within the Works Area, with vegetation being retained wherever practicable. The terrestrial habitats within the Works Area are predominantly of negligible intrinsic biodiversity conservation importance.	The potential for intra-project cumulative effects on terrestrial habitats has already been considered within **Chapter 8: Terrestrial biodiversity and ornithology**. Any unavoidable damage to or loss of habitat within or immediately adjacent to the Works Area would therefore be limited to small areas of habitat that are or no greater than local biodiversity conservation importance. The embedded environmental measures to be implemented through the EMP, for example dust control measures, will minimise the risk of habitat degradation outside of the Works Area.	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Habitats - Marine	Marine biodiversity, water quality and surface water and flood risk	The discharge of water from the Site towards the offshore marine environment (Firth of Clyde), could result in reduced marine water quality and lead to degradation of designated sites. Discharges from vessels during decommissioning and removal of marine infrastructure during the Preparations for Quiescence phase.	The potential for intra-project cumulative effects on subtidal and intertidal habitats has already been considered within **Chapter 9: Marine biodiversity**. Run-off from potentially contaminated land due to the demolition of land-based infrastructure will be controlled using standard site management practices and the risk of such run-off is thus considered to be low be low risk with the appropriate measures in place. Routine discharges from the vessels will be controlled through tertiary environmental measures, adopted in order to comply with applicable legislation. The likelihood of non-routine events will be minimised by the implementation of appropriate management plans.	

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
			However, through the implementation of the embedded measures outlined in the ES no significant effects are anticipated.	
Protected Species - Terrestrial	Terrestrial biodiversity and ornithology, air quality, noise and vibration	Disturbance of otter, breeding bird and bats due to noisy works activities during Preparations for Quiescence and Final Site Clearance phase.	The potential for intra-project cumulative effects on protected terrestrial species has already been considered within **Chapter 8: Terrestrial biodiversity and ornithology**. The Proposed Works are likely to have a temporary, localised displacement effects. The embedded environmental measures to be implemented through the EMP, for example dust control measures, will minimise the risk of habitat degradation outside of the Works Area.	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Protected Species - Marine	Marine biodiversity, noise and vibration, water quality and surface water and flood risk	Seabed intervention may cause a temporary resuspension of solids and increased turbidity as well as underwater noise. The Proposed Works will create limited and temporary resuspension of sediments from the removal of seabed structures. These activities may result in some displacement of fish within the Study Area. Underwater noise may also pose various risks to marine mammals, ranging from disorientation, disturbing their prey, to causing auditory impairments leading to strandings and/or death in extreme cases.	The potential for intra-project cumulative effects on protected marine species has already been considered within **Chapter 9: Marine biodiversity**. The Firth of Clyde is a relatively turbid area within which the fauna and mammals are acclimated to relatively high loadings of suspended sediment. Runoff and treated site drainage will affect a very localised area as it will disperse rapidly due to the relatively energetic marine environment and tidal regime. Furthermore, the habitats potentially impacted are widespread and it is expected that most fish would relocate temporarily to adjacent areas with a lower level of disturbance. With the appropriate EMP in place, the potential for demolition of land-based	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
			infrastructure to impact the fish community is very low. In addition, it is not expected that the Proposed Works will create noise level frequencies that would lead to behavioural disturbance and thus the magnitude of change due to temporary, intermittent and limited duration underwater noise from decommissioning activities is considered to be low.	
Landscape Character	Landscape character and terrestrial biodiversity and ornithology	The modification of the landscape character through construction activity, vegetation loss and visibility of deconstruction construction works in the Preparations for Quiescence phase would have result in adverse effects on LCT 59 - Raised Beach Coast and Cliffs. Effects would become beneficial on the LCT at the end of works.	The Hunterston B: Indicative Interim State Landscape Plan has been designed around the existing ecological baseline (Phase 1) mapping in keeping with the surrounding environment.	

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Above and below ground heritage assets	Historic environment and landscape and visual	Construction works would result in changes to the landscape character and setting of historic assets.	Effects on the setting of Hunterston Castle, Hunterston House and Hunterston House Designed landscape are considered in **Chapter 14: Landscape and Visual Impact Assessment** of this ES. There would be no effect on the designed landscape at Hunterston House, part of which has been built over during the construction of HNB and associated infrastructure. The residual effects identified in **Chapter 14: Landscape and Visual Impact Assessment** already take into account the potential for combined effects and no likely significant residual effects are identified.	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Coastal Protection	Surface water and flood risk, coastal management and water quality	The removal of the jetty and decommissioning of cooling water intake structure during the Preparations for Quiescence may result in the removal of an obstruction to currents and waves. This could lead to long-term localised changes in the wave climate, currents (direction and speed) and associated changes in sediment transport capacity. These changes may lead to long-term changes in coastal processes (erosion deposition regime). Tidal flood risk on buildings within the Site.	The Proposed Works to remove and/or decommissioning marine infrastructure could be considered to represent a return to a natural situation pertaining before the jetty and HNA intake were built in 1959 (subject to climate change considerations). None of the Proposed Works are expected to compromise the condition of the existing coastal flood defences. Each of the proposed new buildings (including the Safestore location) on-site are set back from all of the projected coastal flood risk spatial envelopes, taking into account climate change allowances for 2120. Embedded measures will include coastal protection and flood risk adaptation measures	

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
			and emergency flood planning to further minimise risk on site. As part of the coastal protection and flood risk adaptation measures the HNB Safety Case will be periodically reviewed to take account of any new data such as future updates to information on the condition of the flood defences in the area and/or future updates to climate change allowances.	
Surface water	Surface water and flood risk, coastal management and water quality, soils, geology and hydrogeology	Surface water runoff from adjacent external areas (e.g. HNA) putting site infrastructure and staff at risk. Decommissioning activities and the presence of staff working on-site could alter of existing surface water pathways, and changes in surface water flood risk on site and to surrounding areas. There is potential for an increase in tidal flood risk towards the Site and surrounding areas as a result of	The new buildings on-site mostly avoid areas of existing surface water flooding and the existing drainage system will be in place throughout the Proposed Works, which is designed to sufficiently accommodate surface water runoff. The existing drainage system will be left modified to sufficiently accommodate surface water runoff during the Proposed Works.	

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
		changes in wave energy, and resultant effects on tidal erosion, sediment deposition and weakening of flood defences. Activities have the potential to generate the mobilisation of silt or other contaminants. Substances may also be spilled or leaked during the infilling process.	Embedded measures including site water management measures, flood risk adaptation measures and emergency flood response planning will further minimise risk on site. Measures also include preparation of a drainage plan, and undertaking drainage survey and surface water monitoring will help reduce any potential effects upon ditch water quality during the Proposed Works.	
Ground Water	Surface water and flood risk, coastal management and water quality, soils, geology and hydrogeology	Spillages and infiltration of runoff from the construction	Embedded measures to ensure adequate characterisation of soil and groundwater conditions, and inform the design of remedial measures if needed	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Soils	Surface water and flood risk, coastal management and water quality, soils, geology and hydrogeology	Construction activities may increase soil erosion, compaction and impact on ground stability, or result in the spillage of contaminative materials into soils.	There is potential for interaction of effects on soils, geology and hydrogeology with effects on receptors considered in **Chapter 10: Coastal management and water quality**, and **Chapter 11: Surface water and flood risk**. Construction works may result in a number of effects on the existing soil resource, due to the potential impacts of erosion, compaction, ground stability and the loss of soil resource due to excess material being created during earthworks. However, these effects are not considered to result in a combined effect. In addition, embedded measures lowering the risk of a pollution incident impacting on environmental receptors during changes to the existing drainage systems will reduce	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
			the probability of a pollution incident taking place	

Table 21A.2 Stage 3 intra-project screening table during Quiescence phase

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Landscape Character	Landscape character and terrestrial biodiversity and ornithology	Up to Moderate/Minor (not significant) effects on the landscape character and views during the Quiescence phase due to presence of Safestore.	The Hunterston B: Indicative Interim State Landscape Plan has been designed around the existing ecological baseline (Phase 1) mapping in keeping with the surrounding environment.	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Above and below ground heritage assets	Historic environment and landscape and visual	Minor adverse to negligible effects anticipated during the Quiescence phase due to the presence of the Safestore within the landscape and setting of historic assets.	Effects on the setting of Hunterston Castle, Hunterston House and Hunterston House Designed landscape are considered in **Chapter 14: Landscape and Visual Impact Assessment** of this ES. The residual effects identified in **Chapter 14: Landscape and Visual Impact Assessment** already take into account the potential for combined effects and no likely significant residual effects are identified.	No
Coastal Protection	Surface water and flood risk, coastal management and water quality	Works during Quiescence phase would be minimal and generally restricted to monitoring and maintenance of the Safestore. However, long-term impacts from the removal of the jetty and decommissioning of the cooling water intake structure during the Preparations for Quiescence may remain. This could lead to long-term localised changes in the wave climate, currents (direction and speed) and associated changes in sediment transport capacity. These changes may lead to long-term changes in coastal processes (erosion deposition regime).	None of the Proposed Works during the Preparations for Quiescence and Quiescence phases are expected to compromise the condition of the existing coastal flood defences. The Safestore will be set back from all of the projected coastal flood risk spatial envelopes, taking into account climate change allowances for 2120. Embedded measures will include coastal protection and flood risk adaptation measures and emergency flood planning to further minimise risk on site. As part of the coastal protection and flood risk	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
		On-site maintenance activities also have the potential to generate the mobilisation of silt or other contaminants.	adaptation measures the HNB Safety Case will be periodically reviewed to take account of any new data such as future updates to information on the condition of the flood defences in the area and/or future updates to climate change allowances.	
Surface water	Surface water and flood risk, coastal management and water quality, soils, geology and hydrogeology	Surface water runoff from adjacent external areas (e.g. HNA) putting site infrastructure and staff at risk. Works during Quiescence phase would be minimal and generally restricted to monitoring and maintenance of the Safestore. However maintenance activities on-site could alter surface water pathways, and changes in surface water flood risk on site and to surrounding areas. Maintenance activities also have the potential to generate the mobilisation of silt or other contaminants. There is the potential for an increase in tidal flood risk towards the Site and surrounding areas arising as a result of	The Safestore will be located within areas of outside of existing surface water flooding and the existing drainage system will be in place throughout the Proposed Works and is designed/modified to sufficiently accommodate surface water runoff. Embedded measures including site water management measures, flood risk adaptation measures and emergency flood response planning will further minimise risk on site. Measures also include preparation of a drainage plan, and undertaking drainage survey and surface water monitoring will help reduce any potential effects upon	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
		changes in wave energy, and resultant effects on tidal erosion, sediment deposition and weakening of flood defences.	ditch water quality during the Proposed Works.	
Ground Water	Surface water and flood risk, coastal management and water quality, soils, geology and hydrogeology	Works during Quiescence phase would be minimal and generally restricted to monitoring and maintenance of the Safestore. However maintenance activities on-site may result in spillages and infiltration of runoff from the works.	Embedded measures to ensure adequate characterisation and monitoring of soil and groundwater conditions, and inform the design of remedial measures if needed.	No
Soils	Surface water and flood risk, coastal management and water quality, soils, geology and hydrogeology	Works during Quiescence phase would be minimal and generally restricted to monitoring and maintenance of the Safestore. However maintenance activities on-site may increase soil erosion, compaction and impact on ground stability, or result in the spillage of contaminative materials into soils.	There is potential for interaction of effects on soils, geology and hydrogeology with effects on receptors considered in **Chapter 10: Coastal management and water quality**, and **Chapter 11: Surface water and flood risk**. Maintenance works may result in a number of effects on the existing soil	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
			resource, due to the potential impacts of erosion, compaction, ground stability and the loss of soil resource due to excess material being created during earthworks. Embedded measures to ensure adequate characterisation and monitoring of soil and groundwater conditions, and inform the design of remedial measures if needed.	

Table 21A.3 Stage 3 intra-project screening table during Final Site Clearance phase

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Future workers on the Site	Transport, air quality, noise and vibration	Future workers undertaking final site clearance works on the Site would experience similar (but no worse) transport, air quality, noise and vibration effects to those reported during the Preparations for Quiescence phase.	It is expected the future workers at the Site will reduce gradually during the Proposed Works. Workers will wear appropriate personal protective equipment (PPE), with works managed to reduce potential health risks.	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Hunterston A station site workers	n/a	Not applicable for Final Site Clearance phase as it is assumed works will be complete at Hunterston A during Final Site Clearance.		No
Rural communities in the vicinity of Hunterston B power station site	Noise, air quality, transport, and landscape and visual	Residents would experience similar (but no worse) transport, air quality, noise and vibration effects to those reported during the Preparations for Quiescence phase.	There is the potential for combined effects arising from noise, air quality and the deterioration of visual and recreational amenity. Combined, these effects are likely to lead to an increased sense of disturbance.	Yes
Communities and residential receptors within Millport	Noise, and landscape and visual	Residents would experience similar (but no worse) noise and vibration effects and effects on visual amenity to those reported during the Preparations for Quiescence phase.	Similar to the Preparations for Quiescence phase, noise sensitive receptors are not expected to experience significant noise effects during the Final Site Clearance phase. In addition, views of the Proposed Works during the Preparations for Quiescence phase are considered to be neutral, and not significant. Overall it is considered there is limited potential for intra-project effects to arise on community and residential receptors within Millport.	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Communities and residential receptors within Fairlie	Noise, transport, and landscape and visual	Residents would experience similar (but no worse) noise and vibration effects and effects on visual amenity to those reported during the Preparations for Quiescence phase.	Similar to the Preparations for Quiescence phase, noise sensitive receptors within Fairlie are not expected to experience significant noise effects during the Final Site Clearance phase. In addition, views of the Proposed Works during the Preparations for Quiescence phase are considered to be neutral, and not significant. Overall it is considered there is limited potential for intra-project effects to arise on community and residential receptors within Fairlie.	
Communities and residential receptors within West Kilbride	Noise, and landscape and visual	Residents would experience similar (but no worse) noise and vibration effects and effects on visual amenity to those reported during the Preparations for Quiescence phase.	Similar to the Preparations for Quiescence phase, noise sensitive receptors within West Kilbride are not expected to experience significant noise effects during the Final Site Clearance phase. In addition, views of the Proposed Works during the Preparations for Quiescence phase are considered to be neutral, and not significant.	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
			Overall it is considered there is limited potential for intra-project effects to arise on community and residential receptors within West Kilbride.	
Users of public rights of way, local walks and roads	Noise, air quality and landscape and visual	Decommissioning works during the Final Site Clearance phase would be up to moderate adverse effects (not significant) on landscape character and coastal character areas. These effects would reduce towards the culmination of this phase. Major adverse visual effects (significant) on Power Station Road and Ayrshire Coastal Path during the Final Site Clearance phase. These effects would reduce towards the culmination of this phase. At other views further from the Site, effects would be up to moderate (not significant) during the peak of these phases. Users of these resources would experience similar (but no worse)	There is the potential for combined effects arising from noise, air quality and the deterioration of visual and recreational amenity. Combined, these effects are likely to lead to an increased sense of disturbance.	Yes

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
		transport, air quality, noise and vibration effects to those reported during the Preparations for Quiescence phase.		
Statutory and Non-Statutory Biodiversity Conservation Sites - Terrestrial	Terrestrial biodiversity and ornithology, air quality	Potential dust and vehicle pollutants during final site clearance works would be similar (but no worse) to those reported during the Preparations for Quiescence phase.	The potential for intra-project cumulative effects on terrestrial Statutory and Non-Statutory Biodiversity Conservation Sites has already been considered within **Chapter 8: Terrestrial biodiversity and ornithology**. Works would be managed in accordance with the latest guidance and standards, which may include technological advancements, to minimise the residual effects so that they are not significant.	No.

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Statutory and Non-Statutory Biodiversity Conservation Sites - Marine	Marine biodiversity, water quality and surface water and flood risk	No discharges or marine works are anticipated as a result of the final site clearance works. There is the potential for water run-off to enter the sea.	Run-off from potentially contaminated land due to the demolition of land-based infrastructure will be controlled using standard site management practices and the risk of such run-off is thus considered to be low with the appropriate good practice measures in place.	No.
Habitats - Terrestrial	Terrestrial biodiversity and ornithology, air quality	Potential dust and vehicle pollutants during final site clearance works would be similar (but no worse) to those reported during the Preparations for Quiescence phase.	The potential for intra-project cumulative effects on terrestrial Statutory and Non-Statutory Biodiversity Conservation Sites has already been considered within **Chapter 8: Terrestrial biodiversity and ornithology**. Works would be managed in accordance with the latest guidance and standards, which may include technological advancements, to minimise the residual effects so that they are not significant.	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Habitats - Marine	Marine biodiversity, water quality and surface water and flood risk	No discharges or marine works are anticipated as a result of the final site clearance works. There is the potential for water run-off to enter the sea.	Run-off from potentially contaminated land due to the demolition of land-based infrastructure will be controlled using standard site management practices and the risk of such run-off is thus considered to be low with the appropriate good practice measures in place.	
Protected Species - Terrestrial	Terrestrial biodiversity and ornithology, air quality, noise and vibration	At this time, details on the species present during final site clearance are unknown. Disturbance of species may occur due to noisy works activities during Preparations for Quiescence and Final Site Clearance phase.	The Proposed Works are likely to have a temporary, localised displacement effects on local species within the area at the time of the works. Ongoing monitoring and surveys prior to the commencement of works will be undertaken to determine the level of embedded environmental measures which are required. These could include dust control measures, which will minimise the risk of habitat degradation outside of the Works Area.	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Protected Species - Marine	Marine biodiversity, noise and vibration, water quality and surface water and flood risk	There are no works proposed within the marine environment during the final site clearance. Disturbance of species may occur due to noisy works activities during Final Site Clearance phase.	It is not expected that the Proposed Works will create noise level frequencies that would lead to behavioural disturbance in fish or mammals and thus the magnitude of change due to temporary, intermittent and limited duration underwater noise from decommissioning activities is considered to be low.	No
Landscape Character	Landscape character and terrestrial biodiversity and ornithology	The modification of the landscape character through construction activity, vegetation loss and visibility of deconstruction works in the Final Site Clearance phase would have result in adverse effects on LCT 59 - Raised Beach Coast and Cliffs. Effects would become beneficial on the LCT at the end of works.	The Site will be managed and cleared to enable future development.	No
Above and below ground heritage assets	Historic environment and landscape and visual	Construction works would result in changes to the landscape character and setting of historic assets. Effects would reduce on assets at the end of the works.	There would be no effect on the designed landscape at Hunterston House, part of which has been built over during the construction of HNB and associated infrastructure.	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
Coastal Protection	Surface water and flood risk, coastal management and water quality	There are no works proposed within the marine environment during the final site clearance. However, long-term impacts from the removal of the jetty and cooling water intake structure during earlier phases may remain from the removal of an obstruction to currents and waves. This could lead to long-term localised changes in the wave climate, currents (direction and speed) and associated changes in sediment transport capacity. These changes may lead to long-term changes in coastal processes (erosion deposition regime). On-site maintenance activities also have the potential to generate the mobilisation of silt or other contaminants.	Changes in coastal processes could be considered to represent a return to a natural situation pertaining before the jetty and HNA intake were built in 1959 (subject to climate change considerations). However, none of the Proposed Works during this phase are expected to compromise the condition of the existing coastal flood defences. The Site will be managed to ensure appropriate implementation of coastal protection and flood risk adaptation measures as required to further minimise risk on site.	No
Surface water	Surface water and flood risk, coastal management and water quality, soils, geology and hydrogeology	Decommissioning activities and the presence of staff working on-site could alter of existing surface water pathways, and changes in surface water flood risk on site and to surrounding areas. There is the potential for an increase in tidal flood risk towards the Site and surrounding areas as a result of changes in wave energy, and resultant	The existing drainage system will be left in place throughout the Proposed Works and will be modified to sufficiently accommodate surface water runoff. Embedded measures including site water management measures, flood risk adaptation measures and	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
		effects on tidal erosion, sediment deposition and weakening of flood defences. Activities also have the potential to generate the mobilisation of silt or other contaminants. Substances may also be spilled or leaked during the infilling process.	emergency flood response planning will further minimise risk on site.	
Ground Water	Surface water and flood risk, coastal management and water quality, soils, geology and hydrogeology	Spillages and infiltration of runoff from the construction.	Embedded measures to ensure adequate characterisation of soil and groundwater conditions, and inform the design of remedial measures if needed.	No
Soils	Surface water and flood risk, coastal management and water quality, soils, geology and hydrogeology	Decommissioning activities may increase soil erosion, compaction and impact on ground stability, or result in the spillage of contaminative materials into soils.	There is potential for interaction of effects on soils, geology and hydrogeology with effects on receptors considered in **Chapter 10: Coastal management and water quality**, and **Chapter 11: Surface water and flood risk**.	No

Receptor	Relevant aspects	Effect	Potential for Intra-Project Cumulative Effects	Taken forward to Stage 4
			Construction works may result in a number of effects on the existing soil resource, due to the potential impacts of erosion, compaction, ground stability and the loss of soil resource due to excess material being created during earthworks. However, these effects are not considered to result in a combined effect. In addition, embedded measures lowering the risk of a pollution incident impacting on environmental receptors during changes to the existing drainage systems will reduce the probability of a pollution incident taking place.	

Appendix 21B: Long List of development

Table 21B.1 Long list of development

ID	Council	Application Reference	Address/Post code	National Grid Reference	Description of development	Tier
HNA	North Ayrshire / ONR	n/a	Hunterston A Nuclear Power Station		Ongoing decommissioning works associated with Hunterston A Nuclear Power Station. HNA site is part way through its Care and Maintenance Preparations (C&MP) phase of decommissioning which, is currently forecast to complete by October 2030. Further details are not available, however it is expected that the final site clearance will overlap with the HNB Quiescence phase.	1
1	North Ayrshire	22/00209/EIA	Site to the north of Lawhill Farmhouse West Kilbride North Ayrshire	NS 21925 48255	EIA Scoping Opinion request for 49.9 MW Solar Farm Development.	3
2	North Ayrshire	22/00133/PPPM	Former Coal Terminal Hunterston West Kilbride Ayrshire	NS 20155 53275	Planning permission in principle for the erection of a high voltage cable manufacturing facility, including detailed planning permission for the construction of a 185m high extrusion tower with associated factories, research and testing laboratories, offices with associated stores, transport, access, parking and landscaping with on-site generation and electrical infrastructure and cable delivery system.	1

ID	Council	Application Reference	Address/Post code	National Grid Reference	Description of development	Tier
3	North Ayrshire	21/01174/PPM	Site to the north of Summerlea Road and west of Snowdon Terrace Seamill West Kilbride Ayrshire	NS 19759 48256	Erection of 220 dwelling houses and associated infrastructure and landscaping	1
4	North Ayrshire	21/00622/EIA	Hunterston Construction Yard Fairlie Largs Ayrshire	NS 18625 53053	EIA Screening Request for a proposed 49.9MW cryogenic energy storage facility.	3
5	North Ayrshire	21/00480/EIA	Former Coal Terminal Hunterston West Kilbride Ayrshire	NS 19820 52384	EIA screening request for proposed synchronous compensator.	3
6	Energy Consents Unit	ECU00003319	Campbelton Farm, on Beech Avenue in Hunterston, North Ayrshire	NS 18852 51058	Grid services facility comprising 2 battery storage facilities, a synchronous condenser with flywheel designed to adjust and support frequency and voltage conditions on the electrical grid and other associated ancillary electrical infrastructure. The electrical export capacity of the Development will be up to approximately 450 MW.	1
7	North Ayrshire	20/00213/EIA	Ardrossan Harbour Montgomerie Street Ardrossan Ayrshire KA22 8LY	NS 22955 42391	Request for EIA Screening Opinion for liquid natural gas bunkering facility for the Ardrossan to Arran Ferry Service.	3

ID	Council	Application Reference	Address/Post code	National Grid Reference	Description of development	Tier
8	North Ayrshire	23/00575/PP	Biglees Quarry West Kilbride Ayrshire	NS 20958 51497	Extraction and processing of stone and blending with manufactured aggregate	1
9	North Ayrshire	23/00178/EIA	Site To North Of Girthill Farm Saltcoats Ayrshire	NS 26724 47042	Request for EIA Scoping Opinion for the realignment of the B714 between Sharphill Roundabout and Hillend Roundabout	2
10	North Ayrshire	23/00074/EIA	Site To West Of 55A Montgomerie Street Ardrossan North Ayrshire	NS 22761 42634	Request for EIA screening opinion for new Ardrossan Community Campus comprising of Early Years, Primary School. Secondary School, Additional Support Needs, Community Library, Community Sports Facilities: Swimming Pool, Sports Hall, Gymnasium, Dance Studio, Fitness studio, External Sports Pitches: 2 Full-size multi-sport pitches; 1 Muga, Co-located Public Services: Health, Social Work, Campus Police Officer, Associated Landscape and Parking spaces	3
11	North Ayrshire	23/00024/EIA	Site To The North East Of Wee Minnemoer Millport Isle Of Cumbrae Ayrshire	NS 17026 56885	Request for EIA screening opinion for revised solar farm application	3
12	North Ayrshire	22/00979/PP	Hunterston Construction Yard Fairlie Largs Ayrshire	NS 18757 52965	Planning Application seeking temporary consent for the establishment of a Fastrig Wing Sail Test Facility Yard to include all temporary buildings (including workshop,	3

ID	Council	Application Reference	Address/Post code	National Grid Reference	Description of development	Tier
					storage, office, canteen and WC), access, parking and other required infrastructure	
13	North Ayrshire	23/00148/PP	Site To West Of Campbelton Farm Hunterston Estate West Kilbride North Ayrshire	NS 19030 50960	Construction of 200 Mega volt amps (MVar), 400 kilovolt (kV) shunt reactor as an extension to the existing substation and ancillary development including construction of new access track and realignment of an existing track, construction of retaining walls and drainage facilities, and installation of security fencing	1
14	North Ayrshire	23/00454/EIA	Site To East Of Wardlaw Wood Windfarm Dalry North Ayrshire	NS 25577 51931	Request for EIA Screening/Scoping Opinion for proposed 19.99 MW Battery Energy Storage System	2/3
15	North Ayrshire	23/00528/EIA	Former Coal Terminal Hunterston West Kilbride Ayrshire	NS 19975 52455	Request for EIA Screening opinion for installation of stability island	3
Local Development Plan						
17	North Ayrshire	NA1113	Land At Blairland Farm, Dalry	NS 29931 48708	200 houses	3
19	North Ayrshire	NA1096	Sharphill East, Saltcoats	NS 25176 43386	240 houses	3

ID	Council	Application Reference	Address/Post code	National Grid Reference	Description of development	Tier
20	North Ayrshire	SDA No 1	Hunterston	NS 20073 53057	Business and industry 81 ha	3
21	North Ayrshire	NA0923	Ardrossan Harbour, Ardrossan	NS 22688 42559	439 Homes	3
22	North Ayrshire	Na1108	West Of Sharphill, Saltcoats	NS 24638 43378	200 houses	3
23	North Ayrshire	Employment Location	Hunterston	NS 18315 51361	277 ha	3
24	North Ayrshire	Employment Location	Ardrossan Harbour, Ardrossan	NS 22894 42615	3 ha	3
25	North Ayrshire	Employment Location	Sharphill, Saltcoats	NS 25012 41992	3.5 ha	3

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