

CLACKMANNANSHIRE COUNCIL

**STIRLING - ALLOA - KINCARDINE RAILWAY (ROUTE RE-
OPENING) AND LINKED IMPROVEMENTS (SCOTLAND) BILL**

**ENVIRONMENTAL STATEMENT
VOLUME 1**

MAIN REPORT

FEBRUARY 2003

Scott Wilson (Scotland) Ltd
23 Chester Street
Edinburgh EH3 7ET
Tel: 0131 225 1230
Fax: 0131 225 5582
Ref: B109401ENV1

Contact: Nigel Hackett

Approved for Issue:

Name: N Hackett

Date: 14/02/03

CONTENTS

	Page
1. INTRODUCTION	1
2. THE SCHEME	4
3. ALTERNATIVES	19
4. APPROACH TO ENVIRONMENTAL ASSESSMENT	23
5. SUMMARY OF ENVIRONMENTAL EFFECTS	28
6. CONCLUSION	40

List of Figures

Figure 1.1 Scheme Location Plan

Figure 1.2 Environmental Features and Designations (1/4 to 4/4)

Figure 2.1 Scheme Design (1/17 to 17/17)

1. INTRODUCTION

1.1 Introduction

This document relates to the Stirling–Alloa–Kincardine Railway (Route Re-opening) and Linked Improvements (Scotland) Bill introduced in the Scottish Parliament on 27 March 2003 (to be confirmed). It has been prepared by Scott Wilson Scotland Limited on behalf of Clackmannanshire Council to satisfy Rule 9A.2.3(c)(iii) of the Parliament’s Standing Orders. The contents are entirely the responsibility of the promoter and have not been endorsed by the Parliament.

1.2 Background to project

The Stirling-Alloa-Kincardine Railway route lies within the Clackmannanshire Council, Fife Council and Stirling Council areas, see Figure 1.1. The re-opening would involve re-constructing the line between Stirling and Kincardine along its former route and upgrading the existing railway route between Kincardine and Longannet Power Station. The section of the route from Stirling to Alloa would be re-opened to passenger and freight trains, with a new railway station located at Alloa and a freight only connection through to Kincardine and on to Longannet Power Station.

As the railway from Stirling to Kincardine has not been used for a number of years the Project Steering Group (Clackmannanshire Council, Stirling Council, Fife Council, the Scottish Executive, the Strategic Rail Authority and Scottish Enterprise) needs to obtain statutory powers from the Scottish Parliament to re-open it. Subject to the satisfactory completion of the Parliamentary procedures, construction will commence in Spring 2004, with the route re-opening in Winter 2005/6.

The Stirling-Alloa-Kincardine Route Re-opening Project and the Linked Improvements have been developed to satisfy three objectives:

- to improve public transport access from Alloa, especially to Stirling, Glasgow and Edinburgh;
- to provide an alternative, shorter, more efficient route for coal traffic from Hunterston and open cast mines in Ayrshire to Longannet Power Station in Fife thus reducing congestion on both the road and rail networks; and
- to remove coal trains from the Forth Bridge thereby providing scope for additional passenger services from Fife to Edinburgh and improved reliability for existing passenger services.

1.3 Statutory Context

1.3.1 Scottish Private Bill

The construction of new rail infrastructure projects requires specific statutory authorisation. (This is needed so as to give statutory sanction to what could otherwise be a public or private nuisance and as the only means of authorising compulsory purchase of the land required for the railway.) Prior to devolution, railways in Scotland were authorised by means of provisional Orders made under the Private Legislation Procedure (Scotland) Act 1936, which confers functions on the Secretary of State and the UK Parliament. The Scotland Act 1998 (Modifications of Schedule 5) Order 2002 had the effect of devolving to the Scottish Parliament functions connected with “the promotion and construction of

railways which start, end and remain in Scotland". The 1936 Act therefore no longer applies to railways that come within this description. Such railways must now be authorised by a Private Bill in the Scottish Parliament.

1.3.2 Permitted Development Rights

Article 3 of the Town and Country Planning (General Permitted Development) (Scotland) Order 1992 grants planning permission for the classes of development specified in schedule 1 to the Order.

Class 29 in Part 11 specifies development authorised by (among other legislative instruments) an Act of the Scottish Parliament. The extent of the permission granted is restricted in the ways described in class 29 and the permission given by article 3 is subject to the requirement for environmental assessment. The Bill, when passed, will therefore operate as a grant of planning permission in respect of the works it authorises.

Class 34 of the 1992 Order, grants permission for development by the railway undertakers or their lessees on their occupational land, which is required in connection with the movement of traffic by rail. Such permission is referred to in this Environmental Statement (ES) as Permitted Development Rights (PDR). With the exception of the Listed Buildings, all the works described in the ES between Stirling Middle Signal Box and the Forth Viaduct, and between Hawkhill Road at Kincardine and Longannet Signal Box by Network Rail can be undertaken under PDR. The effect of this situation is that the PDR works do not require to obtain planning permission, and do not need to be included in the Bill. They are, however, described in the ES and their environmental effects assessed as they are a consequence of the works included in the Bill.

1.3.3 Environmental Impact Assessment (Scotland) Regulations 1999

European legislation (EC Directive 85/337/EEC as amended by EC Directive 97/11/EC) provides the framework for the Environmental Impact Assessment (EIA). In Scotland, this is transposed into domestic law for development projects authorised under planning legislation through the Environmental Impact Assessment (Scotland) Regulations 1999, as amended by the Environmental Impact Assessment (Scotland) Regulations 2002 (SSI 2002/324). The requirements of those regulations are applied to the procedures for Scottish Private Bills authorising works by virtue of Rule 9A.2.3(c)(iii) of the Standing Orders of the Scottish Parliament and the Presiding Officer's determinations as set out in Annexes K and N to the Parliament's Guidance on Private Bills. The findings of the EIA for this study are summarised in the Environmental Statement.

1.4 Purpose of the Environmental Statement

The purpose of the Environmental Statement is to provide supporting information for the Bill and for the associated works to be undertaken by PDR. Throughout the ES, the works to be undertaken by the Bill and associated PDR works are referred to as the Scheme. The Scheme described in the ES includes railway works from the Forth Viaduct at Stirling to Hawkhill Road at Kincardine, with associated signalling works from Stirling Middle Signal Box to the Forth Viaduct, together with track improvements and associated signalling works between Hawkhill Road at Kincardine and Longannet Signal Box.

1.4.1 The main aims of the EIA process are:

- To ensure that there will be a full consideration of the likely environmental effects of the Scheme in a way that enables both the importance of the environmental effects and the scope for mitigating these to be properly evaluated; and
- To allow the public, statutory agencies and other bodies to comment on the proposals, taking account of their environmental concerns

1.5 Structure of the Environmental Statement

This document is Volume 1 (Main Report), which presents the Scheme proposals and provides a summary of the significant environmental effects. Volume 2 presents the findings of the environmental studies undertaken for each topic. Volume 3 contains supporting information for a number of the specialist topics, references, a glossary of terms and abbreviations used. In addition, a separate Non-Technical Summary has also been prepared, which provides a brief summary of the Scheme and the principal findings of the environmental assessment in non-technical language.

The scope of this ES has focused on the environmental issues relevant to the Scheme in terms of the construction and operation of the railway. Figure 1.2 shows the location of the principal environmental features and designations along the route.

2. THE SCHEME

2.1 Description of Scheme

Central to the Scheme is the reopening of the former railway route (now variously out of use, disused and abandoned) between Stirling and Alloa for passenger freight services and between Stirling and Kincardine via Alloa for freight services.. The closure of the line between Stirling and Kincardine occurred between 1983 and 1993. Figure 1.1 shows the location of the Scheme in the context of the surrounding area and Figure 2.1 shows the Scheme design proposals.

The former railway is 21 kilometres in length, has 43 structures including 18 overbridges, 17 underbridges, numerous culverts and 12 level crossings covered by the Bill and 2 level crossings covered by PDR. Between Stirling Station and the former Kincardine Junction the solum is double track width and from Kincardine Junction to Kincardine power station the solum is single track width and then rejoins the operational railway east to Longannet. Since the line was closed between 1983 and 1993, it has become extensively overgrown, especially the eastern portion. Rail tracks remain within the Stirling – Alloa section in fair condition and the remainder in poor condition. All the structures remain in place throughout the route. All the existing track will be renewed with new heavy duty track suitable for freight use. Structures will be refurbished/renewed to allow safe operation of the new railway. The track will follow the route of the former railway, and there will be three passing loops at the Forth Viaduct, Cambus and Hilton Farm.

2.1.1 Alloa Station

A new passenger train station will be provided at Alloa, linking the town by rail with Stirling and the direct line to Glasgow, or the connecting line to Edinburgh or the North of Scotland. It is envisaged that it will be possible to catch a train in Alloa and travel directly to Glasgow in approximately 50 minutes. The new station will be developed on the former Carlsberg-Tetley brewery site in the town centre. A single platform station with building will be constructed, complete with fully DDA compliant pedestrian accesses, car parking, taxi stance and bicycle stands. The new platform will be capable of accommodating trains consisting of up to 6 coaches. It is anticipated that in future a mixed-use development will be proposed for the site to incorporate the station, retail and commercial activity.

2.1.2 Signalling

For the Stirling and Longannet areas, the Operational Requirements for this project demand that a satisfactory interface between the existing signalling on the operational line and proposed signalling infrastructure on the new lines is attained, whilst still meeting the project objectives for rail operation.

It has been considered that this should be achieved with minimal impact on the existing signalling arrangements and infrastructure, as otherwise potentially substantial reworking of the existing signalling arrangements at both locations could result together with associated financial and operational implications.

Due to the derelict nature of the signalling infrastructure between Stirling and Longannet and the changed operational requirements, it has been considered that there is no feature or asset of signalling equipment that may be reused in this project.

As such, this section of line has been considered to be a “new railway” in terms of signalling infrastructure provision, and has been proposed accordingly.

To meet the Project Steering Group aspiration of having operational control of the reopened line from Stirling, it is proposed that operational control of the line between Stirling, Alloa, and Kincardine will be predominantly vested in Stirling North signal box via a new man-machine interface, with only that portion of line between Clackmannan (exclusive) and Kincardine being controlled by the existing Longannet signal box.

There is a risk that the useable platform length at Stirling Station on platform 6 may reduce due to the new signalling for the Scheme. The risk, however, is negligible.

At Stirling Station, there will be disruptive possessions required (between Saturday night and Monday morning over a 29 hour period) to allow a new signal gantry boom to be erected and the new signalling system to be commissioned. It is envisaged that there will be two disruptive possessions required over successive weekends. However, to minimise service disruption, there is the possibility of ‘Pilot Working’ whilst the new signalling system is commissioned, i.e. limited controlled train movements through the station area without the signalling system in operation - although this would involve significant safety planning. During the signalling work, there may be a minor increase in vehicular construction traffic, but this would be mostly at night time. In addition, the train and freight operating companies would be compensated for any disruption to their services.

2.1.3 Permanent Way

The proposed single track layout with passing loops has been designed to accommodate heavy freight trains running in both directions between the existing operational areas of Stirling Station and Kincardine/Longannet. Wherever reasonably practical the track alignment has been designed to permit freight trains to run at speeds up to 60mph while keeping the track alignment within the existing rail corridor. In order to allow trains to pass loop lines have been included at Forth Viaduct, Cambus and Hilton Farm. In order to accommodate the proposed passenger service between Stirling and a new (terminus) station at Alloa, a turnback platform siding would be provided just east of the former Alloa Station on the former brewery site.

2.1.4 Fencing

Fencing will be provided along both sides of the railway corridor, primarily to mark the boundary of the Scheme land ownership, to prevent trespass and as a safety and access barrier. The type of fencing will vary between different land uses, and may also serve as noise barriers where deemed appropriate. As a general rule, post and wire fencing will be provided in rural areas with palisade fencing being used in urban areas.

2.1.5 Alloa Eastern Link Road

The construction of a new link road to the east of Alloa, the Alloa Eastern Link Road (AELR), is to be included in the Bill. The link road will provide alternative routes to the east of Alloa, required due to the closure of level crossings at Hilton Road and Hilton Farm.

The proposed AELR is approximately 1 km of single carriageway comprising of a 7.3m wide carriageway with a kerb upstand; 2.0m verge; 2.0m footpath and a 0.5m berm either side and 1:3 cut/fill slopes.

The AELR will extend from an upgraded roundabout at the junction of the A908 Whins Road/ Carsebridge Road/Hilton Road to a new Roundabout constructed on the A907 Clackmannan Road east of Alloa. The road will be mainly at grade or on embankment rising up over the Stirling – Alloa – Kincardine Railway Line on a 3 Span Concrete Integral Bridge Structure.

The A907 Clackmannan Road will need to be diverted off-line in order to facilitate both the increased height required to cross the Stirling – Alloa – Kincardine Railway Line and facilitate construction of the realigned sections.

The AELR will pass through an area of industrial land to the north requiring the demolition of three Warehouses and passing through an area of agricultural land to the south. The presence of mine workings within the vicinity of the site will require consolidation grouting with any mineshafts backfilled or capped.

2.1.6 Summary of Scheme Components

The Scheme requires a number of site-specific works and operations to be undertaken, covering a wide range of engineering disciplines. Table 2.1 outlines the permanent proposals of the Scheme and describes the extent of the work in each instance.

Table 2.1: Scheme Works and Operations (Continued over)

Location	Type of Work/Operation	Description
Stirling Middle signal box	Permanent Modification	Internal modification to signal box, Provision of a Relocatable Equipment Building (REB) in proximity to signal box to accommodate new signalling interlocking and associated equipment
Stirling North signal box	Permanent Modification	Miscellaneous improvement works – floor surface, windows, ceiling, equipment space below operating floor, etc. Provision of a Relocatable Equipment Building (REB) in proximity to signal box to accommodate new signalling interlocking and associated equipment
Stirling North – Forth Viaduct	Infrastructure works	Provision of new signals, telephones, and associated track and other works between the north end of platform 10 and the lines towards Alloa situated south of the Forth Viaduct, to support the stated operational requirements
Forth Viaduct (UB 117/45)	Bridge works	Major works to be carried out on Eastern bridge of the Forth Viaduct, a 3-span lattice girder. Works are to include the strengthening and repair of the superstructure and the stabilisation and repair of the sub-structure.
	Bridge works	Scour protection works to viaduct and adjacent structure
	Passing Loop	Bi-directional passing loop to be constructed.

Location	Type of Work/Operation	Description
Causewayhead Level Crossing	Level Crossing Closure	Current AOCL is not operational. It is to be permanently closed and vehicular access is to be provided for with the construction of new roads. There is also to be temporary works access to the line
Waterside Level Crossing	Level Crossing Upgrade	The Level Crossing will be upgraded to an automatic half barrier (AHB). There will be a new road junction with improved surfacing. There will be a new Relocatable Equipment Box (REB) for new signalling equipment.
Abbeycraig Level Crossing	Level Crossing Closure	Current Automatic Open Crossing Locally Monitored (AOCL) is not operational. It is to be permanently closed and vehicular access is to be provided by the construction of new roads. There is also to be temporary works access to the line
Logie Burn	Bridge Works	Logieburn Culvert to be replaced with pre-cast concrete box culvert.
Grangehall	Bridge Works	Grangehall Culvert to be replaced with pre-cast concrete box culvert.
Manor Neuk	Level Crossing Maintenance	Level crossing to be maintained as user worked crossing (UWC).
Manor Powis	Level Crossing Upgrade	Maintained as a UWC with locked gates
	Vehicular Access Improvements	Access road requires upgrading to suit works traffic
	Bridge Works	Devegetation and a waterproof deck-slab required.
UB117/42A Manor Steps Culvert	Bridge Works	Existing culvert to be replaced with Precast Concrete Box Culvert
Blackgrange	Level Crossing Upgrade	Level crossing will be upgraded to an AHB.
Cambus Viaduct	Bridge Works	Devegetation, blasting and painting of steelwork, waterproof decking and scour protection of sub-structure required.
New Mills Level Crossing	Level Crossing Closure	Level crossing to be closed.
Cambus Level Crossing	Level Crossing Upgrade	Existing Level Crossing to be upgraded to an MCB3 or AHB
	Permanent Work	REB provided for signalling equipment
	Passing Loop	Bi-directional passing loop to be constructed.
UB117/41D	Culvert Works	Culvert to be replaced with precast concrete pipe
UB117/41C	Culvert works	Culvert to be replaced with precast concrete box culvert
UB117/41B	Culvert works	Culvert to be replaced with precast concrete box culvert
Alloa New Marshalling Yards	UB117/41B Bridge Works	Existing culvert to be replaced with a precast box culvert.
	Permanent access	New REB provided with permanent access via Alloa West Business Park
Grange Road	Level Crossing Closure	Existing level crossing to be closed.

Location	Type of Work/Operation	Description
	New private access	New access to dwelling from Stirling Road. Access off Grange Road closed
	Bridge Works	New footbridge to be constructed
Claremont	Bridge Works	Devegetation and masonry repairs are required.
Ludgate	Bridge Works	Devegetation, masonry and parapet repairs are required
	Wall works	Repairs to retaining walls between Claremont and Erskine Street
Mar Place	Bridge Works	Devegetation and masonry repairs required.
	Permanent Land take	New REB provided and with permanent access
Fairy Burn	Bridge Works	Culvert to be replaced with pre-cast concrete box culvert.
Alloa Town Centre	Bridge Works (Erskine Street)	Replacement of existing span over railway with composite deck, repairs to masonry parapet. Ramped access path to station to be provided over/from this structure.
	Retaining Wall	Reconstruct lineside retaining wall on south side adjoining Erskine Street Bridge.
	Bridge Works (Old Rail Bridge) Argyll Street	Existing masonry arch footbridge to be removed
	Bridge Works (Whins Road)	Devegetation, repairs to steelwork and re-pointing and repairing of masonry may be required.
	Bridge Works (Brothie Burn)	Devegetation, masonry repairs, parapets/handrail realignment, deck waterproofing will be required.
	Permanent Land Take	Footpath to be upgraded to utilise Brewery Underpass access
	Permanent Land Take	New station development and car parking as part of a mixed-use development on the former brewery site.
	Vehicular Access Improvements	Improved vehicular access via new round-a-bout to the west of the site from the Ring Road.
Former Balfour Road Level Crossing	Level Crossing Maintenance	Level crossing will remain closed.
OB117/34B Bruce Street footbridge	Bridge works	Minor corrosion repairs to footbridge
Hilton Road	Level Crossing Closure	Level Crossing to be closed
	Permanent Land Take	Formation of hammerhead to Alloa vehicle to turn
	Bridge Works	New footbridge to be built
AELR and side roads	New Road Construction	New road to be built in East Alloa, connecting Clackmannan Road and Hilton Road.
Alloa East/Hilton Farm	Old mine workings	Grouting and capping of mineshafts
Hilton Farm	Passing Loop	Bi-directional passing loop to be constructed.
	Level Crossing	Existing level crossing to be closed.

Location	Type of Work/Operation	Description
Hilton loop	Permanent land take	Access to REB off dual carriageway
UB119/36 Helensfield	Bridge Works	Devegetation, masonry repairs. Superstructure to be replaced.
UB119/35 Devonway	Bridge Works	Bridge to be infilled. Gas pipe to be sleeved to allow future renewal.
Black Devon Burn	Bridge Works	Major works to replace superstructure
Millbank Cresc.	Bridge Works	Bridge to be infilled.
Mill Road	Bridge Works	Minor works and devegetation to wrought iron beams with brick jack arching
Cattle Market	Bridge Works	Minor works and devegetation to wrought iron beams with brick jack arching.
Northfield	Bridge Works	Minor works and devegetation to wrought iron beams with brick jack arching
Goudnie Burn	Bridge Works	Existing culvert to be replaced with a precast concrete box culvert.
Kennet Cottages	Mine workings	Grouting and capping of mineshafts
	Culvert Works	Devegetation, masonry repairs and the introduction of parapets and handrails will be required.
Kennet	Bridge Works	Minor works and devegetation to wrought iron beams with brick jack arching
Old Farm Road	Bridge Works	Minor repairs to wrought iron beams and cross girders with brick jack arching and re-pointing of masonry are all required.
West Farm Road	Bridge Works	Minor repairs
Kilbagie	Bridge Works	Devegetation, blasting and painting of ironwork and re-pointing of masonry are all required.
Canal Burn	Bridge Works	Single pipe to be replaced with precast concrete pipe
Inveresk Farm	Bridge Works	Wrought Iron single span deck to be replaced
Broomknowe	Bridge Works	Single span twin girder steel deck to be replaced
Tulliallan	Bridge Works	Devegetation, invert repairs and masonry repairs are all required.
Tulliallan – Broomknowe	Rock cutting repairs	Stabilisation of rock cutting
Tulliallan Castle	Bridge Works	Devegetation, masonry repairs and deck waterproofing are all required.
Kincardine Power Station	Bridge Works	Minor repairs
Hawkhill Road	Bridge Works	Devegetation, blasting and painting of ironwork and re-pointing of masonry are all required.
	Permanent works	New REB and permanent access
Kincardine Station Road Level Crossing	Level Crossing upgrade	Kincardine Station Road level crossing is proposed for upgrading to an Automatic Half Barrier Crossing, Locally Monitored (ABCL) style of level crossing
Kincardine South	Track upgrade	Track replaced with a single through 'main line' together with a single-track facility giving access to the former power station site

Location	Type of Work/Operation	Description
Kincardine Area	Infrastructure works	Provide new signals, telephones, and associated track and other works in the Kincardine area to support the stated operational requirements
	Sea wall	Repair works to existing sea wall
Longannet West Arrival Line	Infrastructure works	Provide a cable route in one cess of this line between the Main Line and the rail access gates to the Longannet complex. One Under Track Crossing (UTX) may be required for this cable route depending on the alignment chosen for the cable route towards Kincardine. Provision of new telephones, boards, and associated track and other works
Longannet West Departure Line	Track works	Provide a cable route in one cess of this line between the Main Line and the rail access gates to the Longannet complex. One Under Track Crossing (UTX) may be required for this cable route depending on the alignment chosen for the cable route towards Kincardine. Provision of new telephones, boards, and associated track and other works
Longannet Signal Box to Kincardine	Permanent Modification	Works would include replacement or upgrading of existing plain line track as required
Longannet Power Station west arrival Level Crossing	Permanent Modification	Provision of a gate, telephone, some minor regrading of the approach road and vegetation clearance
Longannet Power Station west departure Level Crossing	Permanent Modification	Provision of a gate, telephone, some minor regrading of the approach road and vegetation clearance
Longannet signal box		Miscellaneous improvement works – floor surface, windows, ceiling, equipment space below operating floor, etc. Provision of cable route access/egress to the building. Provision of cable trunking access/egress to the operating floor. Provision of a REB in proximity to signal box.

2.2 Required Land Take

2.2.1 Permanent Land-take

The re-opening of the Stirling-Alloa-Kincardine railway has been developed as far as possible to keep new infrastructure within the existing railway corridor in order to minimise new land take and disruption to neighbours.

In places, however, it is not possible to achieve the re-opening of the railway wholly within the existing railway boundary. Permanent land has been identified for works, which extend

beyond the existing railway boundary including the new station, car park and access at Alloa, signalling equipment, road improvements, relocation of utility apparatus, and installation of level crossing equipment. The principal parcels of land required are summarised in Table 2.2 below (some minor areas of permanent land take for maintenance of culvert headwalls have been excluded). Details of the land to be acquired are contained in the Private Bill and shown on the accompanying plans.

Table 2.2: Permanent Land-take

Location	Purpose	Approx Size (m²)
Ladysneuk Road	Signalling equipment and access (REB)	420
Waterside Level Crossing	Level crossing equipment	300
Ladysneuk Road, Stirling	Provision of new vehicular access to premises (Riverside development and Waterside Cottage)	2,450
Abbeycraig Level Crossing	Provision of new access road to premises and stopping up of existing level crossing junction	4,160
Logie Burn Culvert	Culvert headwalls	70
Grangehall Culvert	Culvert Headwalls and maintenance	520
Manor Powis/ Powis Burn	Level crossing equipment, structure maintenance	110
Blackgrange Level Crossing	Signalling equipment and access (REB) and relocation of utility apparatus	1,290
Cambus Viaduct	Scour protection to bridge pier	90
Station Road Level Crossing, Cambus	Signalling equipment and access (REB)	190
Gables Culvert	Culvert Headwall and maintenance	60
UB/117/41C- Culvert	Culvert Headwalls and maintenance	150
Alloa West, former Marshalling Yard	Signalling equipment and access (REB)	350
Grange Road, Alloa	Footbridge	5,240
Mar Place, Alloa	Signalling equipment and access (REB)	220
Erskine Street and Former brewery site, Alloa	Alloa Station, car park and station access	7,030
Petrol Station, Ring Road, Alloa	New roundabout and station access	9,720
Junction with Carsebridge Road, Hilton Road & Whins Road, Alloa	Upgraded roundabout at north end of Alloa Eastern Link Road	4,360
Hilton Road, Alloa	Realignment of road to provide junction with new Alloa Eastern Link Road	570
Diageo Bonded Warehouses and Hilton Farm	Alloa Eastern Link Road	65,600
21 Hilton Road, Alloa	Hammerhead	310
Recreation Park, Hilton Road, Alloa	Hammerhead and footbridge	1,010
Playground off Gaberston Avenue	Footbridge	400
Playing field off Hilton Road, Alloa Football Club Car park	Signalling equipment (REB) and track access	2,850
Hiltonhawk Way, Alloa	New vehicular access to premises (garage)	450
Farmland south of A907/ existing A907	Realignment of A907	32,740
Hilton Farm Level Crossing	Stopping up existing junction	40
Off A907 Helensfield	Access to Signalling equipment	350
A907 underbridge, Helensfield	Safeguarding limits	60
Northfield, Clackmannan	Culvert headwall and maintenance	100
Station Road, Kincardine	Signalling equipment and access (REB)	210

2.2.2 Temporary Land-take

In order to carry out the works associated with the Scheme, many of them will require a temporary works compound for storage of materials and plant and for site accommodation in connection with the associated work force. The location of these temporary works compounds has been carefully considered with respect to local resident intrusion, noise and visual impact while meeting the key needs of the proposed works. The compounds and their associated accesses and other land required as working space to allow construction to proceed are shown in the Parliamentary Plans, and summarised in Table 2.3. Consultation has taken place with Railtrack, the Local Authorities, Diageo, The Snowie Group, the Earl of Mar and Scottish Power as those who own a significant proportion of land adjacent. Wherever possible consultation with the remainder of landowners/users will be made at an early date regarding temporary use of land.

Table 2.3: Temporary Land take

Location	Purpose	Approx Size (m²)
Stirling Station	Access for construction	460
Forth Street (adj. to Forth Viaduct)	Construction compound and access	2,380
Lover's Walk, Stirling	Access for construction	650
River Forth and banks	Working space	8,670
Bridgehaugh, Stirling RFC	Construction compounds and access	10,100
Causewayhead Road, Stirling	Working space and access	840
Abbeycraig Level Crossing	Construction compound/working space	11,940
Logie Burn, Stirling	Work space and access	2,980
Grangehall, Stirling	Work space and access	1,650
Manor Neuk Level Crossing	Working space	80
Manor Powis Level Crossing	Construction compound	2,160
Blackgrange Level Crossing	Construction compound	11,080
New Mills Level Crossing	Construction compound/working space	7,390
Cambus Level Crossing, Cambus	Construction compound	5,390
Alloa New Marshalling Yard	Construction compound/working space	44,880
Grange Road and Dirleton Gdns.	Working space	660
Alloa Sports Centre	Construction compound working space/access	1,380
Erskine Street, Alloa	Construction compound working space and access	7,100
Former Brewery site, Alloa	Construction compound working space/access	1,850
Recreation Park, Alloa	Construction compound working space/access	14,050
Bonded warehouses, Hilton Road, Alloa	Construction compound/working space	19,670
Hilton Farm, Alloa	Construction compound working space/access	20,670
Helensfield, Clackmannanshire	Construction compound/working space	8,410
Black Devon river crossing	Construction compound working space/access	8,600
Cattle Market off Alloa Road, Clackmannan	Construction compound working space/access	5,340
Kennet, Clackmannanshire	Access for construction	1,150
Kennet, Clackmannanshire	Construction compound and access	2,870
Meadow End, Clackmannanshire	Construction compound working space/access	18,000
Kilbagie, Clackmannan/Fife	Work space and access for construction	1,710
Kilbagie, Clackmannan/Fife	Construction compounds	6,560
Broomknowe, Fife	Construction compound/working space	9,900
Tulliallan Bridge	Construction compound	270
Kincardine Power Station Fife	Access for construction and maintenance	2,400
Kincardine Power Station Fife	Construction compound	7,530

2.3 Construction Activities

The railway route-wide work lends itself to a multiple front approach wherein several types of work associated with different disciplines are underway at the same time. Much of this

work will have a common completion date co-incident with the final preparations for formally re-opening the line.

It is envisaged that procurement of the railway work will be via a series of contracts involving main contractors and sub-contractors. The extent, phasing and duration of the works will depend on the Contractors' programme and methods of working which will be for the contractors to determine subject to the requirements and constraints imposed to minimise construction impacts.

A list of the principal materials quantities envisaged is shown in Table 2.4.

Table 2.4: Trackwork Material Quantities

Material Description	Provisional Quantity
Recovered rails	2,159 tonnes
Recovered sleepers	3,626 No.
Recovered ballast	70,000 tonnes
CEN60 Rails (plain line new in 600ft lengths)	270 No.
Steel sleepers (new)	37,000 No.
Track turnouts (new S & C)	10 No. turnouts
Track ballast (new)	35,000 tonnes

A list of the principal materials quantities envisaged for the AELR is shown in Table 2.5.

Table 2.5: AELR Material Quantities

Material Description	Provisional Quantity
Site clearance	8.1 ha
Demolition of structures	3 No. bonded warehouses
Fencing	4,600 m
Earthworks	134,00 m ³
Drainage	3,700 m
Kerbing	3,500 m
Pavement	21,650 m ²
Structures	Road over rail bridge, culvert
Landscaping	12,000 m ²

In order to facilitate at-grade access to the railway line/solum, existing level crossings will be used where reasonably practical. Road vehicles removing waste materials and bringing new materials from/to the works will be able to load/unload directly onto the solum or otherwise use works compounds adjacent to selected level crossings (and elsewhere) chosen to aid lineside access and storage while minimising intrusion.

Temporary works compounds will principally be used in connection with track works strategically positioned to allow existing track to be recovered and new sleepers to be laid in two directions, working out from the storage areas. It is envisaged that track (plain line) will be assembled in-situ from components (rails, sleepers etc) with only sleepers delivered by road, principally by way of the A907. Existing track and waste ballast could primarily be removed from the work areas by road after being broken down into component form for scrap because they do not meet the required standard for new track.

In addition to the temporary lineside works compounds, a work area with a siding at each of the existing operational areas of Stirling and Kincardine would be required for storing/loading engineers trains. The out of use north end of the Up and Down lines beyond Stirling Station Platforms Nos. 6 and 9 with its rounding facility would be employed for works trains. Long welded rail trains from the manufacturer's steel mills and stone ballast delivered in wagons from the nearest suitable quarry would be stabled here for propelling into the work site.

The size of the railway work areas would need to be substantially increased to accommodate the old material being stored and then later removed by rail. There is a large area of land adjacent to the rail corridor owned by the SRA who, it is understood would be willing to allow its use. Temporary storage of redundant material here, especially the large volume of spent ballast, would reduce the need to remove it all by road. It could periodically be removed by rail as soon as the new track has been laid as far as Cambus. Using the existing tracks between Stirling and Cambus to assist the works remains an option. The frequency of HGV movements through built-up areas such as Alloa and Clackmannan and on the main A907 road would be tailored/extended to acceptable levels. To reduce the volume of spent ballast removed a temporary screening machine to recycle/recover stone would be installed. This would be located at the SRA site at Cambus. Recovered stone would be loaded onto wagons.

The solum and adjacent slopes will be cleared of vegetation and the old formation levelled. Plain line track would be assembled along the solum by laying out in stages new sleepers previously delivered by road to the various work compounds then transported along the old formation. Rails would be delivered to each end of the route in stages in long welded lengths (180m) by works trains operating from Stirling and Kincardine. The rails would be removed from the wagons and clipped onto the sleepers. The temporary use of 22m long serviceable rail may be employed to expedite the track laying process. A second work train would then tip ballast over the track from hopper wagons and the track would then be lifted, packed and levelled to its horizontal and vertical design.

As the lengths of track laid from either end of the line increases; the use of on-rail equipment will predominate and when a sufficient length of track is completed further ballast delivered from rail wagons, loaded either within the existing operational railway or at a remote works compound, would be spread and compacted around/below the track using on-track tampers followed by track liner machines.

The 10 No. turnouts (a set of points allowing tracks to diverge) required will be assembled from components in-situ, or by lifting in by mobile crane short lengths of trackwork switches and crossings pre-assembled as near to their final position as reasonably practical. Provision has been made for work areas adjacent to each new turnout. Turnouts would be positioned just prior to the advancing plain line track (length of normal track with no switches or crossings) laying operation.

Rail mounted plant and equipment and engineers trains would traverse level crossing roads at walking speed with crossing control by way of a banksman/handsignals or temporary traffic lights. The level crossings which are to be maintained/upgraded would not be commissioned until much nearer the train testing/driver training phase of a new operational railway, all subject to the close examination and approval of Her Majesty's Railways Inspectorate (HMRI).

On completion of the track laying new cabling would be run-out from trains and laid in previously assembled troughing. New signals, telephones, equipment cabinets etc. would be erected and the new station and car park constructed. Agreed permanent mitigation measures would be implemented including noise barriers and screen fencing.

One structure, the Forth Viaduct, requires major repairs. These would take the form of strengthening the south-west abutment using mini piles and selective steelwork repairs to the superstructure followed by blast-cleaning and painting throughout. The viaduct would require scaffolding to allow access and to prevent debris falling into the River Forth. Noise suppressed equipment and plant would be used and any toxic materials such as old red lead paint will be gathered up for careful disposal.

The remainder of the railway metal deck bridges would also require scaffolding for cleaning and painting, however, UB (underbridge) 119/36, Helensfield, where the line crosses over the A907 will be re-decked. The redecking of this bridge would involve temporary closure of the A907 to allow lifting out of the old deck and lifting in the new deck by crane. A diversionary route will be provided through Clackmannan. The work on the other metal decked underbridges over roads would involve half road closures with temporary traffic control measures. The closure and infilling of two underbridges (UB119/33 and UB 119/35) is proposed. Skewed masonry arched OB (overbridge) 117/37 which carries a footpath would be removed to accommodate the new track alignment and adjacent OB 117/38 would be re-decked to provide a foot access to the new station and surrounding area. UBs 119/23 and 119/24 would be re-decked.

A number of brick and masonry retaining walls require repairs and several railway boundary walls are unstable and would be replaced by fencing.

A number of existing railway piped culverts are in a poor state of repair and would be replaced with precast concrete box culvert units. The existing pipe would be dug out in an open excavation and the new units delivered by road and lifted into place using an all-terrain mobile crane. This work would be carried out at an early stage in the overall works programme so as not to interrupt work along the route.

Repair and regrading of a small number of cutting and embankment slopes would be carried out using conventional civil engineering plant working from the solum and/or from adjacent fields. Unstable material would be removed and replaced with selected well compacted granular material and new slope drainage provided where appropriate.

The new Alloa Station and car park would be constructed on part of the former brewery site land with construction access taken from Izatt Street. General up-filling would be required in this area for the new car park and road access using imported fill material. The new station platform and access paths would then be constructed. An existing retaining wall near OB 117/38 would be rebuilt further from the former station platform rail line in order to accommodate the new station siding and to support the path from the overbridge to the station.

In addition to the site compound for the AELR, it will also require topsoil storage areas and a haul road on the line of the new road. The topsoil storage areas will be located at the former bonded warehouse area. As the construction of the AELR requires to cross the Brothie Burn it will be necessary to construct a temporary culvert and a new culvert. A new road-over-rail bridge is required at the road's south east end. Best practice construction will be adopted during the AELR construction work.

Traffic management measures will be required to be put in place during construction of the roundabouts for the new station access and at A908 Whins Road/Carsebridge Road and at the A907 Clackmannan Road, construction of the B909 Hilton Road and Hilton Farm accesses and the tie in to the A907. These measures will include contra flows and lane closures with traffic light controls.

The AELR crosses the railway line via a new overbridge and it will be necessary to ensure that construction takes account of any constraints related to a railway. However, it is intended that the construction programme for the AELR would take place when the railway is non-operational to ensure that there is no construction work once the railway is open.

All of the work could be restricted to normal working hours 08.00 – 18.00 Monday to Friday (or as required). Construction works would comply with the relevant noise, health and safety legislation.

2.4 Operational Characteristics

2.4.1 Current Rail Freight Movements

The movement of coal to Longannet Power Station is generally fed from three external sources. This is broadly split as follows:

- About 1 million tonnes by road
- About ½ million tonnes by rail from the north east
- About 1 ½ million tonnes by rail from the south west

All the rail freight movements from the south-west cross the Forth Bridge and use the line from Dunfermline to Kincardine. The rail freight from the north-east also uses this line.

This presents some problems. The freight traffic takes up valuable rail paths on lines to the west of Edinburgh and also on the Forth Bridge. Meanwhile, weight restrictions on the Forth Bridge also limit the weight of coal carried by all coal trains crossing the Forth.

On average about 7000 tonnes of coal is delivered to the Longannet Power Station each day by rail (Monday to Friday and half as much on Saturday). With the current weight restrictions on the Forth Bridge this requires about nine train loads; without the restriction five trains would be required.

2.4.2 Predicted Rail Traffic

The scheme design provides for 15 freight trains in each direction per day. The route will enable Freight Operators to use HTA (hopper) style wagons, which are capable of carrying 77 tonnes of material per wagon (instead of the 32 tonnes limit of the current two axle hopper wagon used by the coal freight operator). It is anticipated that on an average day only four or five coal trains would use the route and, therefore, there would be a capacity for other freight operators to run trains.

Additionally, the scheme will provide for an hourly passenger service between Stirling and Alloa, which is proposed to be an extension of the existing Glasgow Queen Street to Stirling service. It will operate between the hours of 0630 and 2315 daily, resulting in 17 passenger trains in each direction per day.

The service will offer a 50 minute journey between Glasgow and Alloa and a 10 minute journey between Stirling and Alloa.

2.4.3 Speed of railway

The route has been designed to achieve maximum speeds of 70mph for passenger trains and 60mph for freight where possible. Due to topographical or operational constraints, speeds have been restricted at locations shown in Table 2-6.

Table 2.6: Speed Restrictions

Location	Speed Restriction
Forth Viaduct	45mph for freight and 45mph for passenger towards Stirling (only)
Clackmannan between Mill Road and Cattle Market	40mph
Hawkhill Road, Kincardine to Longannet Power Station	20mph
Kincardine Level Crossing	10mph

3. ALTERNATIVES

A number of alternative solutions have been considered during the progression of the Scheme design. This has been an iterative process involving a range of options and the evolution of the Scheme through engineering and design and the environmental process itself. The following Scheme alternatives have been considered:

3.1 **Stirling-Alloa Kincardine Rail Line re-opening Benefit Study, Final Report, MVA (February 2002).**

This report considered the following alternatives:

- Option A: Freight Only – Low Speed and Volume
- Option B: Freight Only – High speed but low volume (50mph and 2.3 trains/day)
- Option C: Freight Only – High speed and volume
- Option D: Passenger Only – High speed and volume
- Option E: Passenger and Freight – High speed and volume (50mph and 15-18 trains/day for freight and 70mph and 1 train/hour for passenger services)

The outcome of the MVA study was to proceed with Option E, as this was the only option which met all three Scheme objectives (see Section 1.2). It offers both freight and passenger services and the number of freight services it can accommodate allows freight currently being transported over the Forth Bridge to be transported via the Stirling-Alloa-Kincardine railway thus relieving pressure on the Forth Bridge. In addition, the option improves efficiency and increases capacity of coal transportation to Longannet Power Station.

3.2 **Clackmannanshire Public Transport Fund Bid, Clackmannanshire Council (August 2000).**

This document compared the re-opening of the Stirling – Alloa – Kincardine route, against a ‘Do Nothing’ scenario, which included Clackmannanshire Council’s current commitments with substantial enhancements to the bus services and infrastructure, including the upgrading of the A907.

The appraisal compared the effects of each of the scenarios on the issues of integration and accessibility, economic analysis, safety, and environmental impact. The re-opening of the Stirling – Alloa – Kincardine line was preferable to the ‘Do Nothing’ option as identified benefits included:

- Promotion of an integrated transport system
- Reduction of social exclusion
- Increase in access to local and regional employment areas
- Reduction in private car usage
- Expected reduction in roadside noise levels
- Improvement of Local Air Quality
- Reduced visual intrusion of traffic from roads

3.3 Clackmannan Rail Bypass Option Appraisal, Babbie (October 2002)

Following the public exhibitions and consultation meeting held in Clackmannan on 18 and 19 September and in response to several individual representations, which highlighted the concerns of those living adjacent to the line in Clackmannan with regard to noise and vibration, the Project Steering Group commissioned a technical feasibility study and Scottish Transport Appraisal Guidelines Part 1 Assessment to look at alternative routing options which would bypass the main residential areas of Clackmannan as follows:

Line A Do Nothing -The rail alignment would be left as it is, and the Scheme would operate on the existing track. Adverse environmental issues identified were some noise and vibration during construction, which could be mitigated through design planting and operating control. Beneficial environmental issues identified were no heritage related demolition required and no biodiversity loss of any valuable land.

Line B Option 1 -This option utilises part of the former Dunfermline route, including the crossing of the Black Devon River, which would reduce the costs of this bypass route. Utilisation of this route would through the alignment out beyond Tullygarth and would require extensive earthworks east of Tullygarth, and possible Compulsory Purchase Orders (CPO). The alignment continues south, crossing the Goudnie Burn before a reverse curve allows the tie-in with the existing rail line through to Kennet.

Line B Option 2- The existing B910 underbridge would be re-used before the new alignment departs from the Dunfermline branch prior to crossing the Black Devon, passing through forestry and crossing an access road. The alignment curves south, passing just to the west of Tullygarth, crossing the Goudnie Burn. A new skewed overbridge would be required under the A907 close to the tie-in to the existing alignment at Kennet. CPO would be required and environmental constraints would be expected.

Line B Option 3- Only one of the existing structures would be re-used in the most direct option. The new alignment would depart from the Dunfermline branch shortly after crossing the access road to Hillend. The line would cross the B910 and the Black Devon approximately at right angles then following a flat curve down to the tie-in at Kennet. A new crossing of the Goudnie burn would be required as well as a heavily skewed overbridge under the A907. CPO would be required and environmental constraints would be expected.

Line B Environmental Issues- Adverse environmental issues identified were heritage related demolition with regard to a chimney and biodiversity loss of significant areas of prime agricultural land. Beneficial environmental issues identified were construction noise, and operation noise and vibration sited away from properties.

The Base Case option (Line A) was selected as no heritage related demolition would be required and there would be no biodiversity loss of any valuable agricultural land, as the railway would be within the existing railway corridor.

3.4 Kincardine Rail Bypass Option Appraisal, Babbie (November 2002).

In response to feedback from public consultation held in Kincardine in September and a subsequent meeting with the Kincardine Railway Concern Group regarding noise and vibration concerns from residents adjacent to the line in Kincardine, a technical feasibility study and STAG1 Assessment were commissioned to consider options for the railway to be moved further away from residential areas as follows:

Base Case/ Do Nothing- The Scheme would utilise the existing track.

There would be some noise/vibration during construction and operation. This could be mitigated through design planting, noise barriers and operating control. There would be no loss of any valuable land as the railway would be within the existing railway corridor.

Option A – Realignment- The alignment of the operational track would be moved as far as possible from residential dwellings to the east of the solum, yet would remain within the identified rail corridor. This would re-use the existing structures with new track and provide a more efficient alignment as it is the most direct route. There would some noise/vibration during construction and operation. This can be mitigated through design planning, noise barriers and operating control. There would no loss of any valuable land.

Option B – Off Line -To ensure a greater reduction of noise and vibration impacts upon local residential receptors, the track would be re-aligned outside of the rail corridor. It would provide a straighter alignment allowing for more consistent track speed whilst reducing certain environmental impacts. The route would be diverted on a path that would require land take from the former Kincardine Power station, owned by ScottishPower. Construction noise and operation noise and vibration would move away from properties. There would be the loss of a low lying, wetland area and potential to impact on drainage over a much wider area. This is contrary to local government policy, as it would result in the loss of an identified amenity area.

All of the alignments are close to residential property and will therefore have some impact in terms of noise/vibration during construction and operation of the railway. The differences however are marginal in this respect. Option B would effectively mean the loss of an identified recreation area, contrary to Local Plan policy. On this basis, re-use of the existing Stirling - Alloa - Kincardine line was progressed. Option A provides the most cost effective and efficient option possible within the identified constraints and limits of land ownership.

3.5 Alloa Eastern Link Road

Three options were assessed for the potential alignment of the AELR for inclusion within the Scheme. These were:

Option 1 (the selected option) - The alignment of this proposal would call for a realignment of the A907 directly west of Hilton Farm level crossing, with a new roundabout serving the AELR to the east of Alloa Park retail park. The A907 would then rejoin its original alignment prior to the roundabout that services Alloa Park. Travelling north along the AELR, access can be gained to Hilton Farm by a service road on the east of the AELR, which in turn joins with new access from the existing farm track between Carsebridge Road and Hilton Farm. The alignment incorporates an S-curve within its design, which will minimise the loss of industrial buildings, and will help to reduce speeds on the road. There is a junction off of the AELR before the northern roundabout at Whins Road/Carsebridge Road, meaning that traffic journeys beginning or ending in Hilton Road will not add congestion to the northern roundabout.

Option 2- This proposed alignment varies from Option 1 in a number of ways. The Southern access roundabout is sited further east than before and includes an additional exit to the south that would service the proposed Alloa Park Housing Estate. The access roads leading to Hilton Farm and the existing farm track are altered from Option 1 to

accommodate the linear nature of the alignment. The rest of the option is unchanged from Option 1.

Option 3 - The alignment of this proposal would require the demolition of the Alloa Auto-Breakers and Central Auto Services properties. This is due to the southern access roundabout being sited further west in this option. The existing access roundabout to Alloa Park would have to be demolished, with servicing being provided by an exit to the south-west of the southern roundabout. Due to the revised alignment crossing the solum, the access provided for Hilton Farm and the existing farm track makes for a much simpler junction lay-out. Again the general alignment of the AELR is linear, and the arrangement to the northern section of the road stays the same as the previous options.

Options varied in terms of the design layout of the access junction to Hilton Farm and the southern round-about. Of the three options assessed, the preferred alignment was that outlined in Option 1. This route was chosen as it minimises demolition works to the adjacent warehouses, reduces vehicular speed on the AELR and is strategically placed for Clackmannanshire Council's future development plans. The preferred option can be seen in Figure 2.1.

4. APPROACH TO ENVIRONMENTAL ASSESSMENT

4.1 Scoping

As part of the consultation process, identification of key issues was sought to enable the scope of the EIA to be determined. It was recognised that adverse impacts are likely during the construction and operation of the proposed Scheme. Some impacts will be short term, for example during construction, and others may be permanent, for example land-take, or some may occur as a result of the operation of the Scheme, such as noise and vibration. As a result, mitigation measures have been designed in the Scheme to reduce adverse environmental impacts. The potential environmental issues identified during the statutory and public consultation process are shown in Table 4.1. However, as part of the EIA process and as the Scheme developed, effects were either redefined or new effects identified such that the consultation process was not the only stage at which effects were identified.

Table 4.1: Potential Environmental Issues Identified

Environmental Issue	Construction	Operation
Policy Context	O	➤
Land Use	X	O
Construction Disruption	X	N/A
Community	X	X/➤
Agriculture	X	O
Air Quality	X	O
Landscape and Visual	X	O/X
Ecology	X	O
Geology	X	O
Noise and Vibration	X	X
Water Resources	X	O
Traffic and Transport	X	➤

O No significant effect likely

➤ Positive effect likely

X Negative effect possible

N/A Not applicable

Some of the specific environmental issues identified as being relevant to the Scheme included potential effects on land use and transportation including trunk roads, archaeology, bio-diversity, geology, landscape, Scheduled Sites, adjacent SSSI and Ramsar sites, development sites, flooding, water quality, contaminated land, safety with respect to community and visual amenity, construction phase effects (on river crossings, surface water drainage, flood defences) and noise and vibration effects.

4.2 Generic Methodology

Each of the specialist topic chapters in Volume 2 follows the same format and assessment hierarchy for ease of comparison:

- Introduction –introduces the environmental topic.
- Methodology – describes the methodology that has been used in the assessment of the environmental topic.
- Consultations – details the consultations undertaken by each environmental topic including the concerns expressed as a result of the consultations.

- Baseline –describes the study area used as well as the baseline information obtained and the date of any surveys undertaken. The baseline also takes into account any changes, which have been identified as likely to occur either prior to construction or prior to the operation of the railway and associated works. Reference sources are generally identified in Volume 3.
- Environmental Effects - Identifies the possible range and location of potential impacts before mitigation comprising:
 - o Effects of Construction
 - o Effects of Operation
 - o Significance of environment effect – generally set out in tabular form

Unless stated as different, the effects of operation are assessed in 2005 i.e. the proposed date of the route re-opening. In addition, both positive and negative effects are identified and evaluated for both the construction and operational stages and whether or not the effects are direct or indirect; secondary; cumulative; short, medium and long-term; permanent and temporary.

Unless stated as different, a consistent approach has been used throughout the ES to describe the ‘magnitude of impact’ based on criteria comprising ‘Severe’ (an acute change to the environment), ‘Moderate’ (a moderate change to the environment), ‘Slight’ (a small change to the environment) and ‘Negligible’ (a negligible change to the environment). In addition, ‘Substantial’ (a significant implication for the environment), ‘Moderate’ (an implication for the environment), ‘Minor’ (a limited implication for the environment) and ‘Negligible’ (an insignificant implication for the environment) has been used to describe the ‘significance of impact’.

- Mitigation - provides a hierarchy of measures to avoid adverse impacts to features where possible (e.g. by modifying the design or location), and where this is not possible then to minimise the scale, significance or degree of impact and finally to offset or compensate impacts where possible e.g. provision of new opportunities for access.
- Summary – provides a brief summary of the assessment including residual impacts

The environmental assessments have been undertaken in accordance with this format. The assessment methodologies for the specialist topics are described in the individual topic chapters in Volume 2.

A glossary of the main terms and an explanation of the key abbreviations used throughout this ES is given in Volume 3 Chapter 1 Appendix 1C to provide a clearer understanding of the technical language.

4.3 Information Sourced

Environmental information has been obtained from a wide variety of publicly available sources together with a general knowledge of the study area. The information has been drawn from these sources and updated as necessary during the study. Details of the information sources used in this ES are given in Volume 3, Appendix 1A.

4.4 Consultation

The consultation process involved writing to the consultation bodies as defined by the Environmental Impact Assessment (Scotland) Regulations 1999, and undertaking a full

consultation exercise. Discussion of the consultations takes place in each topic chapter in Volume 2.

Consultations with the consultation bodies, together with their responses is included in Tables 4.2 and 4.3. The responses received from these consultees were used in establishing the baseline scenarios for each specialist chapter, and highlighting potential significant impacts resulting from the Scheme. Volume 3, Chapter 1, Appendix 1B gives details of consultation letters and responses received.

Table 4.2: Summary of Consultation with the Consultation Bodies for the Stirling-Alloa-Kincardine Route Re-opening

Consultee	Response
Clackmannanshire Council	Support the Scheme
Falkirk Council	No Response
Fife Council	Response included baseline data and the impacts/mitigation of land use and transportation, archaeology, bio-diversity, geology, landscape and economic development.
Forth District Salmon Fisheries Board	Requested to be consulted regarding any engineering work that will change the flow/form of a channel. Also noted the fact that they were a statutory consultee empowered by the Salmon Act (1986)
Health and Safety Executive	HSE advise that the part of the route is within the vicinity of a COMAH (Control of Major Accident Hazards) top tier whisky site.
Historic Scotland	Have no concerns regarding the Scheme, although if any Scheduled Sites are to be affected by works it is suggested that government guidance is adhered to.
Scottish Executive Development Department	Responses from various departments within the Scottish Executive. Major focus was on the effect on trunk roads.
Scottish Water	Plans and maps were provided of sewers and water mains in the vicinity of the Scheme.
Scottish Environment Protection Agency	Some restriction on works may arise with regard to the construction phase, river crossings, surface water drainage, flood defences and waste management issues.
Scottish Natural Heritage	Provided information on environmental/ conservation designations in the area, namely Abbey Craig SSSI, Firth of Forth SSSI & Firth of Forth RAMSAR.
Stirling Council	Detailed response providing information regarding development sites, archaeological interest, biodiversity, flooding, water quality, contaminated land, safety and visual amenity. Noise stated as a potentially significant issue.

Table 4.2: Continued

Consultee	Response
Clackmannanshire Council	Support the Scheme
Health and Safety Executive	Outlines the application of the Control of Major Accident Hazards Regulations 1999 to the bonded warehouses at Carsebridge. Notes that the operator of the site should have an on-site emergency plan, whilst Clackmannanshire Council should have an off-site plan in case of emergency.
Historic Scotland	Two responses were received from HS. The first response highlighted the location of a Scheduled Ancient Monument (SAM), approximately 115m south of the railway line, which was in close proximity to the southern roundabout of the proposed AELR. The second response provided computer mapping undertaken by HS, which stated that the proposed embankment of the southern roundabout would affect the SAM.
Scottish Executive	Mentions the potential for noise and air quality issues. Recommends taking into account the Sustainable Urban Drainage Systems (SUDS).
Scottish Water	No Response
Scottish Environment Protection Agency	Some restriction on works may arise with regard to the construction phase where work is undertaken near to watercourses and upstream flooding in the past although downstream of AELR is clear of problems. A number of SEPA regulated sites are in close proximity.
Scottish Natural Heritage	No additional information provided.

4.5 Public Consultation

An open and proactive approach was taken to public consultation on the railway route and the AELR. Consultation with the general public was initiated through letter dropping 350 properties adjacent to the line, placing public notice advertisements in five local papers covering all three local authority areas and giving information in advance to groups such as Community Councils. The responses received from this consultation have been taken into account in developing the Scheme, and in helping to highlight potential significant impacts.

Public Exhibitions and Presentations took place over eight days between 16 and 26 September 2002 in central locations in Stirling, Alloa, Clackmannan and Kincardine. Each exhibition lasted two days. Scott Wilson team members staffed exhibitions from 9am until 8pm.

The exhibitions consisted of display boards showing the Scheme at the time of the consultations, including information on level crossing upgrade or closures, passing loop locations, footbridge proposals and Alloa Station Location. Other boards displayed sample passenger timetable, information on the level crossing operation, sample footbridge design and noise and vibration mitigation information. A comments book was provided at each location to enable visitors' to record their comments. Property Engineering Referencing Consultation (PERCS) forms were completed to record specific queries raised, particularly those living adjacent to the proposed Scheme. In addition to the consultation described above, a number of other bodies were consulted and these are described in each topic chapter in Volume 2

4.5.1 Presentations

Presentations using PowerPoint were made in the evenings of 16 September 2002 in Alloa Town Hall, 18 September 2002 in Clackmannan Primary School, 23 September 2002 in Kincardine Community Centre and 25 September 2002 in Stirling Council Chambers. Each presentation was followed by a Question and Answer session and an opportunity provided for individual discussions.

Feedback forms were used to gauge public reaction to the consultation process and the Scheme proposals.

At both exhibitions and presentations, the general public were provided with information on the Scheme, the Bill process and compensation measures.

4.5.2 Feedback from Public Consultation

The general public had five main concerns about the Scheme as developed at the time of consultations: noise impacts, vibration effects, safety, air pollution from dust from coal trains and potential devaluation of properties. Those living adjacent to the proposed Scheme in Clackmannan and Kincardine asked for alternative routes to be considered to avoid passing through residential areas of Kincardine and Clackmannan. Following consultation, the Project Steering Group instructed Scott Wilson to examine the engineering feasibility of alternative routes at Kincardine and Clackmannan. Some respondents questioned the viability of the railway in view of the long-term future of Longannet Power Station and what alternatives were considered for transporting coal to Longannet.

On a positive note, the passenger service was welcomed between Stirling and Alloa, as was the removal of coal transportation from road to rail, in principle.

Many requests were received for passenger services beyond Alloa serving Clackmannan and Kincardine and passenger services east to Dunfermline and Edinburgh.

5. SUMMARY OF ENVIRONMENTAL EFFECTS

5.1 Summary of Effects

The Environmental Statement is structured elsewhere by identifying the environmental impacts and effects that occur, or may occur, in relation to each environmental topic presented (i.e. noise, air, water, and transport). This section draws together in tabular form (see Table 5.1) the environmental impacts and effects that would occur at a given location, or over a given stretch of the Scheme, and thus at each location identifies the principal effects of each topic. It is intended to describe the broad range of issues that may arise at a given location and the mitigation to be applied. These are, however, in summary only and the reader is referred to the relevant topic chapters in Volume 2 for a fuller discussion of each issue.

The column headed 'Summary of effects after mitigation' presents impacts that remain once the scheme is operational and once the mitigation has been applied.

Table 5. 1: Summary of Effects (Continued Over)

Location and Scheme proposals	Summary of effects before mitigation	Mitigation	Summary of effects after mitigation
Stirling Middle and North Signal Boxes to be modified	Construction and operational noise, vibration and construction air quality effects. In addition, the works will affect the Listed Buildings at Stirling Station, comprising Stirling Middle and Stirling North signal boxes, and four of the eleven associated semaphore signals	<p>Compliance with best construction practice for construction noise, vibration and dust control (incl. sheeting of bridges and stockpiles, restricted vehicle speed and road sweeping).</p> <p>Application of relevant Codes of Practice, incl. controlled working hours and compounds located away from built up areas.</p> <p>Works to be sympathetically designed to respect listed building status.</p>	
Forth Viaduct/ Bridgehaugh Allotments/Stirling County RFC with bridge and infrastructure works and REB	Construction and operation noise, vibration and construction air quality effects. In addition, removal of vegetation for construction works will affect landscape and visual amenity. Temporary land take at Stirling County RFC. Permanent land take at Ladysneuk Road. Temporary disturbance to fish and other populations during construction	<p>Compliance with best construction practice for construction noise, vibration and dust control (incl. sheeting of bridges and stockpiles, restricted vehicle speed and road sweeping) .</p> <p>Compliance with relevant Codes of Practice incl. controlled working hours, use of compounds away from built up areas.</p> <p>2m high permanent boundary noise barriers along Causewayhead Road, and anti-vibration measures at Ladysneuk Road.</p> <p>Landscape replacement planting following construction works.</p> <p>Mitigation for temporary and permanent land take by acquisition.</p> <p>Implementation of Best Practice methods during construction</p>	Permanent residual land take at Ladysneuk Road (0.04ha)
Causewayhead Level Crossing – to be permanently closed	Construction and operation noise and vibration	<p>Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours. and compounds located away from built up areas.</p> <p>Construction and operational mitigation noise measures</p>	

Location and Scheme proposals	Summary of effects before mitigation	Mitigation	Summary of effects after mitigation
		with. 2m high permanent noise barriers at Causewayside l/c.	
Waterside Level Crossing (Ladysneuk Road) to be retained and upgraded with REB and new road junction	Construction and operation noise and vibration. Increased vehicle flows during the construction and operational phases. Permanent land take.	Temporary traffic management measures during construction. Compliance with construction Best Practice and relevant Codes of Practice incl. controlled working hours and compounds located away from built up areas. Construction and operational noise/vibration mitigation with permanent 2m high noise barriers and anti-vibration measures at Waterside l/c. Landscape mitigation by screen planting at REB Mitigation for permanent loss of land by acquisition land take.	New permanent REB and road junction. Permanent alternative access route. Permanent residual land take (0.03ha)
Logieburn Culvert with culvert replacement	Increased vehicle flows during construction period and temporary land take requirements with access from the A907. Temporary working space affects landscape and visual amenity	Temporary works traffic management measures at A907/site entrance during construction. Mitigation for temporary and permanent land take by acquisition. Landscape mitigation by re-seeding following construction works	Minor permanent residual land take (0.007ha)
Grangehall Culvert culvert replacement	Increased vehicle flows during construction period and temporary land take for access to A907 via existing ROW. Installation of working space affects landscape and visual amenity	Temporary traffic management measures at A907/site entrance junction during construction. Mitigation for temporary and permanent land take by acquisition land take Landscape mitigation by re-seeding following construction works	Minor permanent residual land take (0.05ha)
Forth Viaduct to Abbeycraig Level Crossing with l/c permanently	Construction and operational noise, vibration, landscape and visual effects and construction air quality effects on adjacent housing, community leisure and	Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours. 2m high permanent boundary noise barriers and anti-	Permanent alternative access route provision. Permanent residual land take at

Location and Scheme proposals	Summary of effects before mitigation	Mitigation	Summary of effects after mitigation
closed and access track upgrade	school facilities in proximity. Temporary land take at Abbeycraig for works compound and permanent land take for stopping up existing level crossing and upgrading access track link to Ladysneuk Road.	vibration measures between Waterside and Abbeycraig level crossings. Post development railway operational noise assessment at No. 60 Alloa Road to confirm noise insulation provision. Construction dust control measures e.g. sheeting of bridges and stockpiles, restricted vehicle speed and road sweeping. Landscape mitigation by replacement planting. Mitigation for temporary and permanent land take by acquisition.	Abbeycraig level crossing (0.4ha)

Location and Scheme proposals	Summary of effects before mitigation	Mitigation	Summary of effects after mitigation
Manor Neuk Level Crossing to be retained and upgraded	<p>Construction and operational noise and vibration but permanent mitigation measures not required as within acceptable limits.</p> <p>Visual amenity affected by works area. Temporary land take.</p>	<p>Compliance with best construction practice and relevant codes of Practice incl. controlled working hours.</p> <p>Mitigation for temporary land take by temporary acquisition.</p> <p>Landscape mitigation by re-seeding.</p>	
Manor Powis Level Crossing to be retained and upgraded	<p>Construction and operational noise and vibration but permanent mitigation measures not required as within acceptable limits.</p> <p>Temporary land take.</p>	<p>Compliance with Best Practice and relevant Codes of Practice incl. controlled working hours.</p> <p>Landscape mitigation by re-seeding.</p> <p>Mitigation for temporary loss of land by temporary acquisition.</p>	
Blackgrange Level Crossing to be retained and upgraded with REB	<p>Construction and operational noise and vibration but permanent mitigation measures not required as within acceptable limits.</p> <p>Temporary and permanent land take.</p> <p>Works compound and permanent REB affects landscape amenity.</p>	<p>Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours.</p> <p>Mitigation for temporary and permanent land take by acquisition.</p> <p>Landscape mitigation by re-seeding.</p>	Permanent residual land take (0.1ha)
New Mills Level Crossing to be permanently closed	<p>Temporary land take for works vehicular access from A907 and access track from level crossing to temporary works compound north-west of level crossing with associated noise impacts within acceptable limits. Cambus Viaduct bridge works creates temporary construction dust effects.</p> <p>Works compound and works area affects</p>	<p>Dust control measures (incl. sheeting of bridges and stockpiles, restricted vehicle speed and road sweeping).</p> <p>Temporary works traffic management measures at the A907/site entrance.</p> <p>Mitigation for temporary land take for works compound access track by temporary acquisition.</p> <p>Landscape mitigation by re-seeding.</p>	Permanent alternative access route.

Location and Scheme proposals	Summary of effects before mitigation	Mitigation	Summary of effects after mitigation
	landscape amenity		
Cambus Level Crossing to be retained and upgraded	<p>Construction and operational noise, vibration and air quality impacts.</p> <p>Temporary and permanent land take.</p> <p>Temporary works compound and works area affects landscape amenity</p>	<p>Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours.</p> <p>Construction and operational noise mitigation with 2m high permanent boundary noise barriers at Cambus l/c.</p> <p>Mitigation for temporary and permanent land take by acquisition.</p> <p>Landscape mitigation by re-seeding and screen planting.</p>	Minor permanent residual land take at Cambus level crossing (0.02ha)
Grange Road Level Crossing to be permanently closed and new footbridge	<p>Construction and operational noise, vibration and air quality impacts.</p> <p>Temporary and permanent land take.</p> <p>New pedestrian/disabled/cyclist overbridge providing safe public crossing of solum but resulting in landscape and visual amenity affect and potential visual intrusion from overbridge users.</p> <p>Temporary construction works compound affects visual and landscape amenity.</p>	<p>Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours.</p> <p>Construction and operational noise/vibration mitigation with permanent 2m high noise barriers and anti-vibration measures at Grange Road l/c.</p> <p>Temporary works traffic/area management measures to ensure public access to properties maintained during construction.</p> <p>Mitigation for temporary and permanent land take for footbridge by acquisition.</p> <p>Landscape mitigation by re-seeding and screen planting</p>	<p>Permanent residual land take (0.5ha)</p> <p>Permanent residual visual intrusion from permanent footbridge</p>
A91/ A907 Roundabout to Grange Road Level Crossing with new passing loop and culvert replacements	<p>Construction and operational noise, vibration, air quality and landscape and visual effects. Temporary and permanent land take.</p> <p>Construction flood risk at River Devon for adjacent and upstream properties.</p>	<p>Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours.</p> <p>Construction and operational noise/vibration mitigation with permanent 2m high noise barriers and anti-vibration measures at Woodside and the Gables at Cambus.</p> <p>Landscape mitigation by screen planting and re-seeding.</p> <p>Mitigation for temporary and permanent land take by</p>	Permanent residual land take (0.08ha)

Location and Scheme proposals	Summary of effects before mitigation	Mitigation	Summary of effects after mitigation
		<p>acquisition.</p> <p>Compliance with construction best practice regarding work on watercourses.</p>	
<p>Former Brewery site (Alloa Station) with new station, access and car parking and REB</p>	<p>Construction and operational noise, vibration, air quality and landscape and visual effects. Temporary permanent land take.</p> <p>Temporary disruption to existing Ring Road traffic and to Alloa Bowl car park.</p> <p>Modal shift by transfer from road to rail of cars travelling to Stirling and onwards to Glasgow and Edinburgh.</p>	<p>Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours.</p> <p>Construction and operational noise/vibration mitigation with permanent 2m high noise barriers and anti-vibration measures at Mar Place, Whins Road/Kingswell Park.</p> <p>Dust control measures (incl. sheeting of bridges and stockpiles, restricted vehicle speed and road sweeping).</p> <p>Temporary traffic management measures incl. temporary traffic light controls, contra flow during construction period to minimise disruption to Ring Road traffic and maintain vehicle access to shopping centre and Alloa Leisure Bowl car parks.</p> <p>Pedestrian, disabled and cyclist access across Ring Road during road works to be maintained at existing pedestrian crossing south of Erskine Street.</p> <p>Landscape mitigation by tree, shrub and screen planting.</p> <p>Mitigation for temporary and permanent land take by acquisition.</p>	<p>Permanent residual land take (1.7ha)</p> <p>Regeneration of part of redundant site by providing new public transport facility and rail service.</p>
<p>Hilton Road Level Crossing to be permanently closed with new footbridge</p>	<p>Construction and operational noise, vibration, air quality and landscape and visual effects for the adjacent properties north of the crossing.</p> <p>Realignment of Hilton Road to provide northern junction with new Alloa Eastern Link Road.</p>	<p>Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours.</p> <p>Construction and operational noise mitigation with 2m high permanent boundary noise barriers and anti-vibration measures between Arrol Crescent to the north west of Hilton Road Level Crossing and residential property located directly north-east of level crossing.</p>	<p>Permanent residual land take (0.5ha).</p> <p>Permanent residual visual intrusion</p>

Location and Scheme proposals	Summary of effects before mitigation	Mitigation	Summary of effects after mitigation
	<p>New pedestrian/disabled/cyclist overbridge providing safe public crossing of solum but resulting in landscape and visual amenity affect and potential visual intrusion from overbridge users.</p> <p>Temporary land take for works compound at Alloa Athletic FC car park and permanent partial garden land take at No.21 Hilton Road.</p>	<p>Dust control measures (incl. sheeting of bridges and stockpiles, restricted vehicle speed and road sweeping).</p> <p>Landscape mitigation by re-seeding and surface reinstatement</p> <p>Mitigation for temporary land take at Alloa FC car park by acquisition and shared use to maintain match day spectator parking facility. Mitigation by acquisition for permanent land take at No.21 Hilton Road.</p>	<p>from permanent footbridge.</p>
<p>Alloa Eastern Link Road and is a new link road</p>	<p>Temporary air quality and landscape and visual effects and construction traffic movements to/from works site on existing public roads</p> <p>Construction and operational noise and vibration but within acceptable limits.</p> <p>Overall changes in air pollution concentrations from road operation but predicted to be small with no changes in air quality objectives at sensitive receptors and within acceptable limits.</p> <p>Temporary disruption to Clackmannan Road and Whins Road/Carsebridge Road traffic during the roundabout construction.</p> <p>Works may affect old mineshafts and mineworkings. Temporary land take requirements for works compounds and working space. Permanent land take</p>	<p>Temporary traffic management measures e.g. during roundabout construction and A907 Clackmannan Road realignment changes incl. temporary traffic light controls and contra flows.</p> <p>Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours.</p> <p>Water bowsers and damp-down sprays to mitigate construction dust effects.</p> <p>Grouting and capping of mineshafts and mineworkings.</p> <p>Mitigation for temporary and permanent land take by acquisition.</p> <p>Road landscape mitigation by screen planting.</p> <p>Temporary and permanent works measures and archaeological evaluation and watching brief to protect adjacent Scheduled Ancient Monument.</p> <p>Alternative access provision to agricultural fields.</p> <p>Best Practice methods to be incorporated during the</p>	<p>Permanent residual land take at AELR (10.4ha)</p> <p>Permanent residual reduction of existing business operations and agricultural land use.</p> <p>Possible residual effect on hydrology of Brothie Burn.</p>

Location and Scheme proposals	Summary of effects before mitigation	Mitigation	Summary of effects after mitigation
	<p>leading to potential reduction of existing business operations and fields in agricultural use.</p> <p>Permanent changes in road traffic noise, vibration and air quality impacts - once AELR is operational.</p> <p>Visual effects on setting of Parkmill Scheduled Ancient Monument</p> <p>In-stream ecological impacts on the Brothie Burn</p> <p>Construction and operational hydrological and geomorphological impacts on Brothie Burn</p>	<p>construction phase.</p> <p>Attenuation of surface water runoff incorporated into design of surface water drainage system and culvert to be designed in accordance with best practice.</p>	
Hilton Farm Level Crossing to be permanently closed	<p>Temporary construction land take.</p> <p>Permanent land take for stopping up existing junction.</p> <p>Construction works compound affects landscape and visual amenity.</p> <p>Alternative access provision for permanently closed l/c.</p>	<p>Temporary works traffic management measures to maintain access.</p> <p>Mitigation for temporary and permanent land take by acquisition.</p> <p>Landscape mitigation by re-seeding.</p>	<p>Permanent alternative access provision for closed l/c.</p> <p>Minor permanent residual land take (0.004ha).</p>
Grange Road Level Crossing to Clackmannan west (A907 Helensfield rail bridge) with new passing loop, bridge works and works to old mines	<p>Construction and operational noise, vibration, air quality and landscape and visual effects.</p> <p>Temporary works compound and access land take.</p> <p>Permanent land take for access to signalling equipment and safeguarding limits at Helensfield.</p>	<p>Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours.</p> <p>Dust control measures (incl. sheeting of bridges and stockpiles, restricted vehicle speed and road sweeping).</p> <p>Construction and operational noise/vibration mitigation with permanent 2m high noise barriers and anti-vibration measures at Park Place to Bruce St., and Clackmannan Rd. east of Hilton Rd. l/c.</p>	<p>Minor permanent residual land take (0.04ha).</p>

Location and Scheme proposals	Summary of effects before mitigation	Mitigation	Summary of effects after mitigation
mines		<p>Post development railway operational noise assessment at Park Place to confirm noise insulation provision.</p> <p>Landscape mitigation by replacement and screen planting.</p> <p>Mitigation for temporary and permanent land take by acquisition.</p>	
Clackmannan to Kennet with bridge works and works to old mines	<p>Construction and operational noise, vibration, air quality and landscape and visual effects.</p> <p>Temporary works compound and access land take.</p> <p>Permanent land take for headwall maintenance access.</p> <p>Works may affect old mineshafts and mineworkings.</p>	<p>Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours.</p> <p>Construction and operational noise/vibration mitigation with permanent 2m high noise barriers and anti-vibration measures at Devonway, Mill Rd. to Park Pl., Millbank Cres., Brucefield Cres. to Ladywood, and Bracken Brae.</p> <p>Post development railway operational noise assessment at Devonway and Northfield Gardens to confirm noise insulation provision.</p> <p>Grouting and capping of mineshafts and mineworkings.</p> <p>Landscape mitigation by replacement planting and re-seeding.</p> <p>Mitigation for temporary and permanent land take by acquisition.</p>	Minor permanent residual land take (0.01ha).
Kilbagie Paper Mill with culvert replacement and bridge works	<p>Construction and operational noise and landscape and visual effects.</p> <p>Temporary works compound and access land take.</p>	<p>Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours.</p> <p>Construction and operational noise mitigation with permanent 2m high noise barriers at Ambleside Haven.</p>	

Location and Scheme proposals	Summary of effects before mitigation	Mitigation	Summary of effects after mitigation
		Landscape mitigation by re-seeding. Mitigation for temporary land take by acquisition.	
Kilbagie Paper Mill to Kincardine with rock stabilisation and bridge works	Construction and operational noise, vibration and landscape and visual effects. Temporary works compound and access land take.	Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours.. Construction and operational noise/vibration mitigation with permanent 2m high noise barriers and anti-vibration measures at Broomknowe Drive. Landscape mitigation by replacement planting. Mitigation for temporary land take by acquisition.	
Kincardine Power Station with bridge works, new REB and track re-alignment	Construction noise, vibration and visual effects. Temporary works compound and access land take.	Compliance with Best Practice and relevant Codes of Practice incl. controlled working hours. Mitigation for temporary land take by acquisition.	
Kincardine - Station Road Level Crossing to be retained and upgraded with REB	Construction and operational noise and vibration but permanent mitigation measures not required as within acceptable limits. Permanent land take requirement for REB	Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours. Landscape mitigation by screen planting Mitigation for permanent land take by acquisition.	Minor permanent residual land take (0.02ha)

Location and Scheme proposals	Summary of effects before mitigation	Mitigation	Summary of effects after mitigation
Kincardine (west to central village areas)	<p>Construction and operational noise and vibration impacts.</p> <p>Modal shift by transfer from road to rail of approx. 184,000 per year equivalent coal carrying lorries supplying Longannet Power Station on local road network</p>	<p>Compliance with best construction practice and relevant Codes of Practice with controlled working hours.</p> <p>Construction and operational noise/vibration mitigation with permanent 2m high noise barriers and anti-vibration measures at Ochil View.</p> <p>Landscape mitigation by re-seeding and screen planting.</p>	Permanent modal shift by transfer from road to rail of coal carrying lorries.
Kincardine (east) to Longannet Power Station with sea wall repair and level crossing upgrades	<p>Construction and operational noise and vibration but within acceptable limits.</p> <p>Modal shift by transfer from A985 road to rail of approx. 75,000 per year equivalent coal carrying lorries supplying Longannet Power Station from Rosyth.</p>	Compliance with best construction practice and relevant Codes of Practice incl. controlled working hours.	Permanent modal shift by transfer from road to rail of coal carrying lorries.
Scheme wide	Reduction in bird breeding grounds along the rail corridor	Incorporation of Best Practice methods will reduce unnecessary disturbance to bird breeding grounds	Temporary minor adverse effects on bird breeding grounds
	Disturbance to in-stream ecology at the River Forth, Black Devon, River Devon and other water courses	Incorporation of Best Practice methods will reduce unnecessary disturbance in-stream ecology and prevent species population decline.	Temporary negligible adverse effects on in-stream ecology.

6. CONCLUSION

Whilst there are some negative impacts during the construction and operational phases of the Scheme, appropriate mitigation measures will be implemented to ensure that the severity of these impacts are reduced to the greatest degree.

Many of the potential temporary effects of the scheme will arise as a result of construction including temporary land take. Construction disturbance can be mitigated by applying Best Practice methods as recognised through industry standards. In assessing the environmental effects of construction, it has been assumed that best practice methods will be adopted and adhered to.

Noise and vibration effects, were considered a key concern expressed during public consultation. Groups of residential dwellings are situated adjacent to the rail corridor in many locations. However, the potential effects will be mitigated by incorporating noise barriers and vibration reduction measures at identified locations along the route. As a result of these measures, the effects that noise and vibration may have had in Stirling, Cambus, Alloa, Clackmannan and Kincardine will be reduced to within acceptable limits.

The permanent acquisition and use of land required for the Scheme will have isolated, but comparatively significant effects on the environment. The acquisition of prime agricultural land is required for the construction of the AELR, which will directly affect three fields from two farm units. The AELR will also result in the permanent loss of three bonded warehouses. . Other land uses will also be affected by the Scheme, again particularly due to the construction of the AELR, but the effects elsewhere on residential, commercial and recreational uses, as well as vacant land, are considered negligible – minor.

The Scheme also addresses issues of access, related to both agricultural uses and the community. Journey distances between fields and between community facilities will be increased for the owners or tenants of certain holdings, as they will lose the use, or uninhibited access, over level crossings that have been identified for closure or user restrictions.. However, alternative routes are available and two footbridges are planned for construction in the east and west of Alloa, which will reduce the potential impact for community severance. In addition, the AELR is to be constructed as an alternative route to the east of Alloa.

The Scheme is adjacent to some areas that are of landscape or ecological importance, and as such, a Scheme of this nature could have the potential to affect the natural environment. However, the utilisation of the existing railway corridor has significantly reduced these potential effects.

There are potential affects for the various water resources within the area during construction, of which some are more sensitive than others. However, essential works that may affect sensitive water resources will be required to follow Best Practice methods to reduce the likelihood and effects of such operations.

The Scheme will offer an opportunity to reduce the number and movement of freight journeys by road both locally and throughout the Central Belt of Scotland. The modal shift from road to rail will ease congestion on the rail network, and will take coal lorries off the road network. In addition, the new station at Alloa will also improve public transport links.