Appendix 11.4

Hydromorphology Assessment Part 5

Annex 11.4.3 - Hydromorphological Catchment Assessment - 64

Catchment No.	**64**
Catchment Name	-

Channel Nature	Nature of water course	Natural
	Size of water course	Major

Quantitative Spatial Elements	Catchment Area (km^2)	1.2
	Average slope in catchment (°)	15
	% Catchment over 750m (for snow melt risk)	56%

WFD classification	Water, flows and levels	Good
	Physical condition	Good
	Overall ecological status	Good

Geology	Majority Bedrock (see Drawing 11.4.3.1 a and b Catchment 64)	Gaick Psammite formation-Psammite	Resistant to weathering, impermeable
	Is an alluvial fan present at or near the crossing?	Yes	Some risk of channel avulsion, possibly exacerbated by channel realignment.

Environmental designations (see Drawing 11.4.3.1 c, Catchment 64)	Ramsar	No	
	SAC	River Spey	Atlantic salmon, freshwater pearl mussel, otter, sea lamprey
		Drumochter Hills	Acidic scree, alpine and subalpine heaths, blanket bog, dry heaths, monntane acid grasslands , mountain willow scrub, plants in crevices on acid rocks, species-rich grassland with mat-grass in upland areas, tall herb communities, wet heathland with cross-leaved
	SPA	Drumochter Hills	Dotterel breeding, merlin breeding
	SSSI	Drumochter Hills	Breeding bird assemblage, fluvial geomorphology of Scotland, montane assemblage, vascular plant assemblage

Sediment source and supply - Catchment Scale	Changes in slope and channel confinement	See Drawing 11.4.3.2, Catchment 64	
	Is peat present in the catchment?	None	
	Is there a bog burst risk?	None	
	Current valley side or terrace erosion	Yes	
	Potential valley side or terrace erosion	Yes	
	Hill slope failures (including peat slides and debris flows and slides)	Yes	
	Hill slope failures coupled to channel	Yes	
	Vertical incision present in catchment	None	
	Bank erosion/lateral migration	Some	
	Unvegetated bars	Some	
	Wooded/forested areas in catchment	Yes	Chance of floating debris
	Infrastructure type (see Drawing 11.4.3.1 d, Catchment 64)	None	
	Comment on sediment source potential in catchment	Extensive hillslope failures, and valley side erosion provide a large sediment supply to the channel, with potential for more due to the confined naturel of the channel and steep valley sides	
	Comment on sediment supply potential to crossing	Catchment susceptible to flooding from snowmelt, increasing flood frequency therefore increased potential for sediment to mobilise downstream. Reduced slope due to realignment at crossing creates an area of deposition	

Morphology and Process- Reach upstream of crossing	Channel morphology	Plane bed	
	Predominant sediment size	Cobbles and Gravels	
	Unvegetated bars	Yes	Available sediment supply close to crossing
	Vertical incision	Low	Some as channel adjusts
	Deposition	Medium	Some as channel adjusts
	Lateral migration/bank erosion	Medium	Some as channel adjusts
	Infrastructure type (see Drawing 11.4.3.1 d, Catchment 64)	None	
	Impact of infrastructure	None	
	Channel realignment	Yes	Substantial realignment- channel length has increased, reducing the energy gradient creating an area of deposition

Morphology and Process- At crossing	Channel morphology	Engineered	
	Predominant sediment size	Cobbles and gravels	
	Estimated discharge at 1:200 event (m^3/s)	6.93	
	Unvegetated bars	None	
	Vertical incision	None	
	Deposition	High	
	Lateral migration/bank erosion	Low	
	Damaged/unstable drains or armouring	None	

Morphology and Process- Reach downstream of crossing	Channel morphology	Plane bed	
	Predominant sediment size	Cobbles and gravels	
	Unvegetated bars	Yes	
	Vertical incision	High	
	Deposition	Medium	
	Lateral migration/bank erosion	Low	
	Infrastructure type (see Drawing 11.4.3.1 d, Catchment 64)	None	
	Impact of infrastructure	None	
	Channel realignment	Yes	Substantial realignment and change in base level of Truim
Summary behaviour	Sediment supply from coupled hillslope failures upstream, transported along steep and confined channel. Realignment has increased channel length upstream of the crossing, reducing slope and increasing deposition here. Sediment drops out in this area causing lateral adjustment. Erosion downstream of the crossing (due to realignment and confluence with 63) causing incision and bank collapse. Some risk of channel avulsion through alluvial fan deposits. exacerbated by reduction in channel slope created through realignment..		

Photograph 11.4.3.97- Downstream of crossing

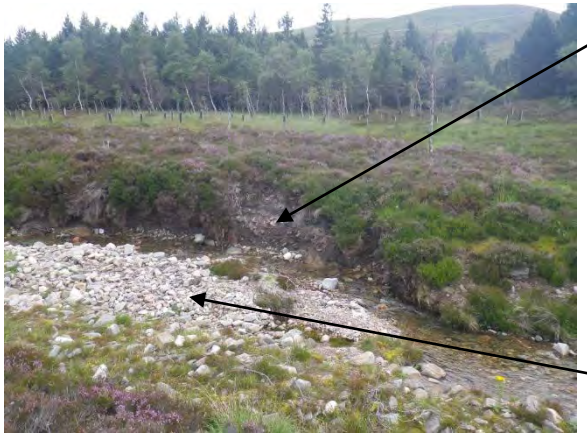
Photograph 11.4.3.98- Deposition in both pipes downstream of crossing

11.4.3.99 Upstream of crossing

11.4.3.100 – Deposition of coarse material in culvert entrance

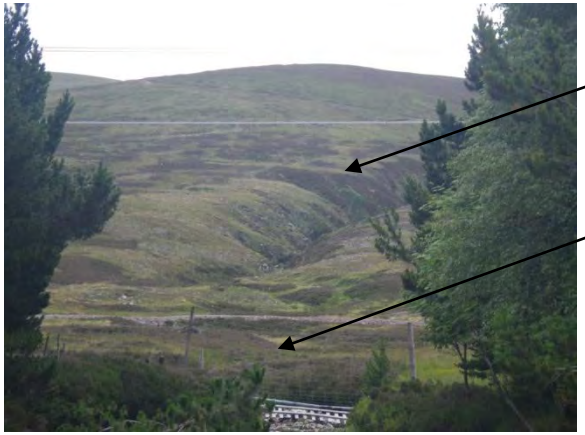
Photograph 11.4.3.101-Upstream bank protection

Photograph 11.4.3.102-Looking South



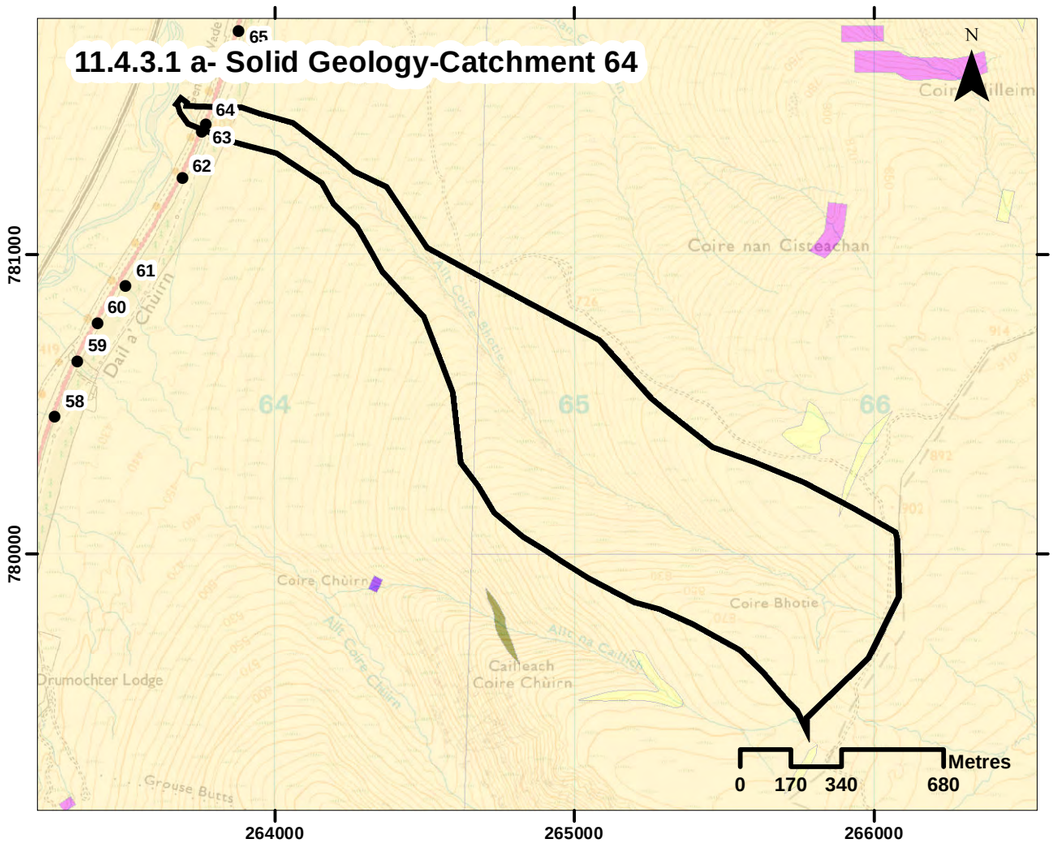
Photograph 11.4.3.103- Left bank

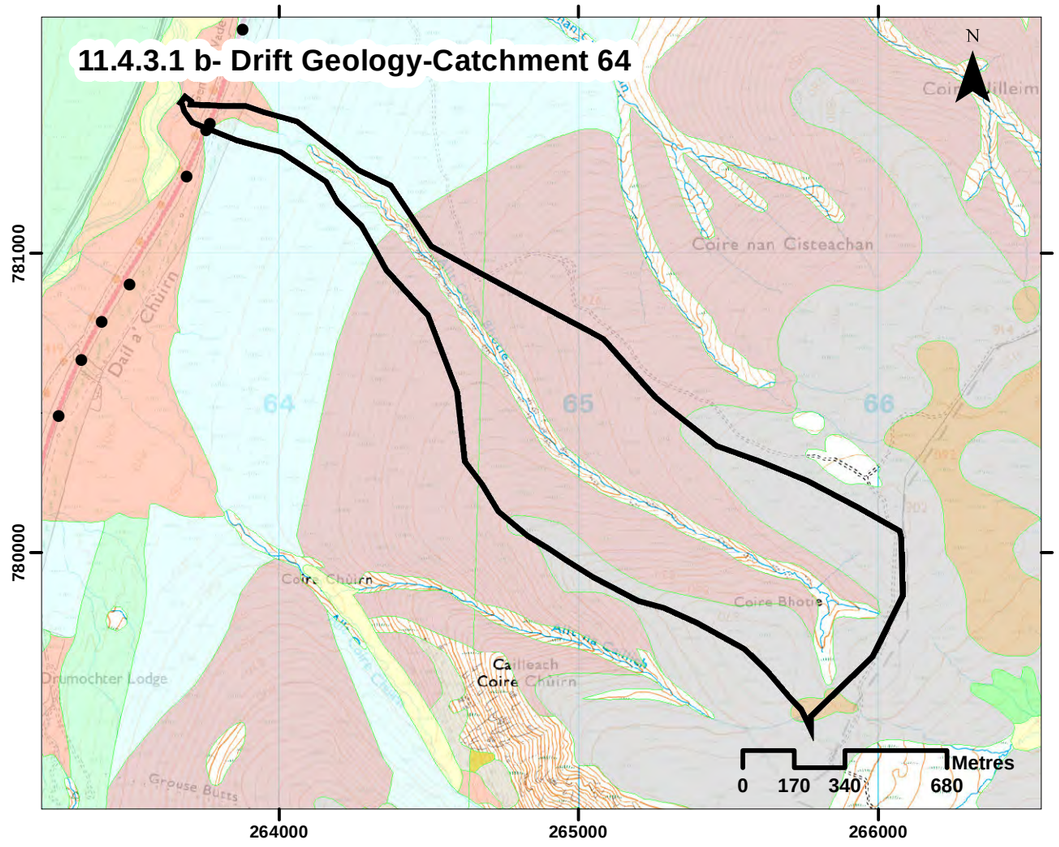
Photograph 11.4.3.104- Sediment rich channel

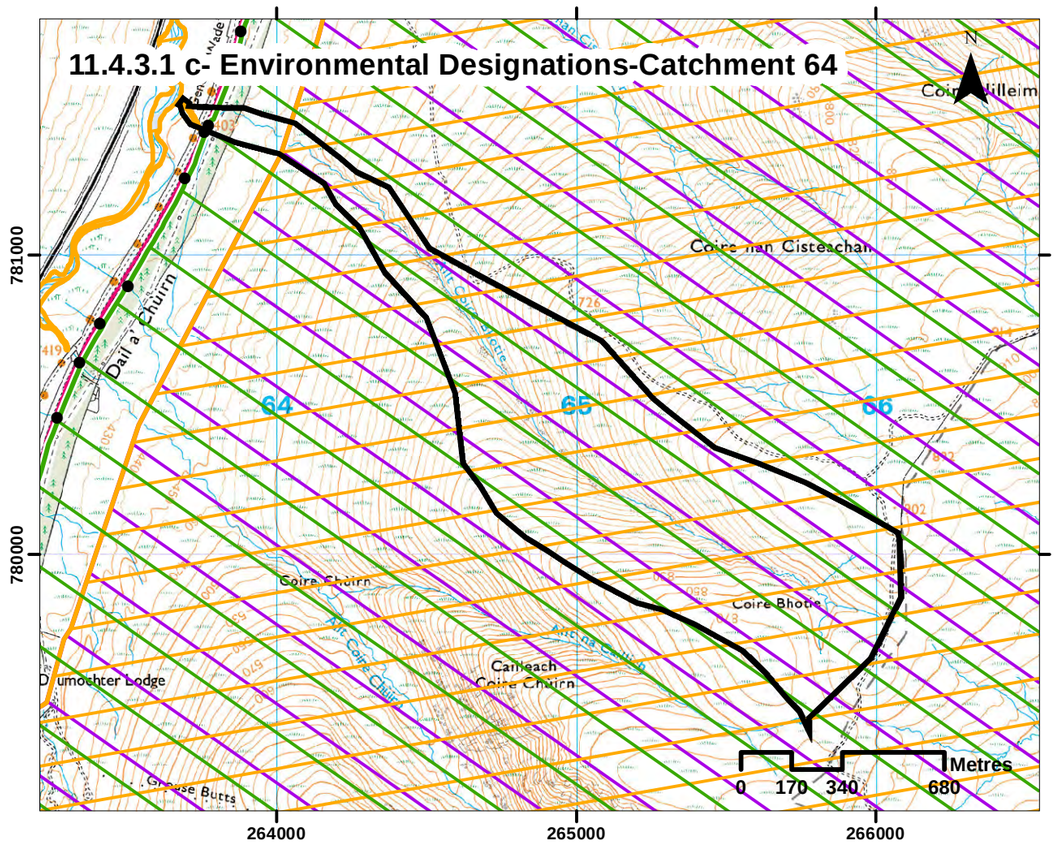


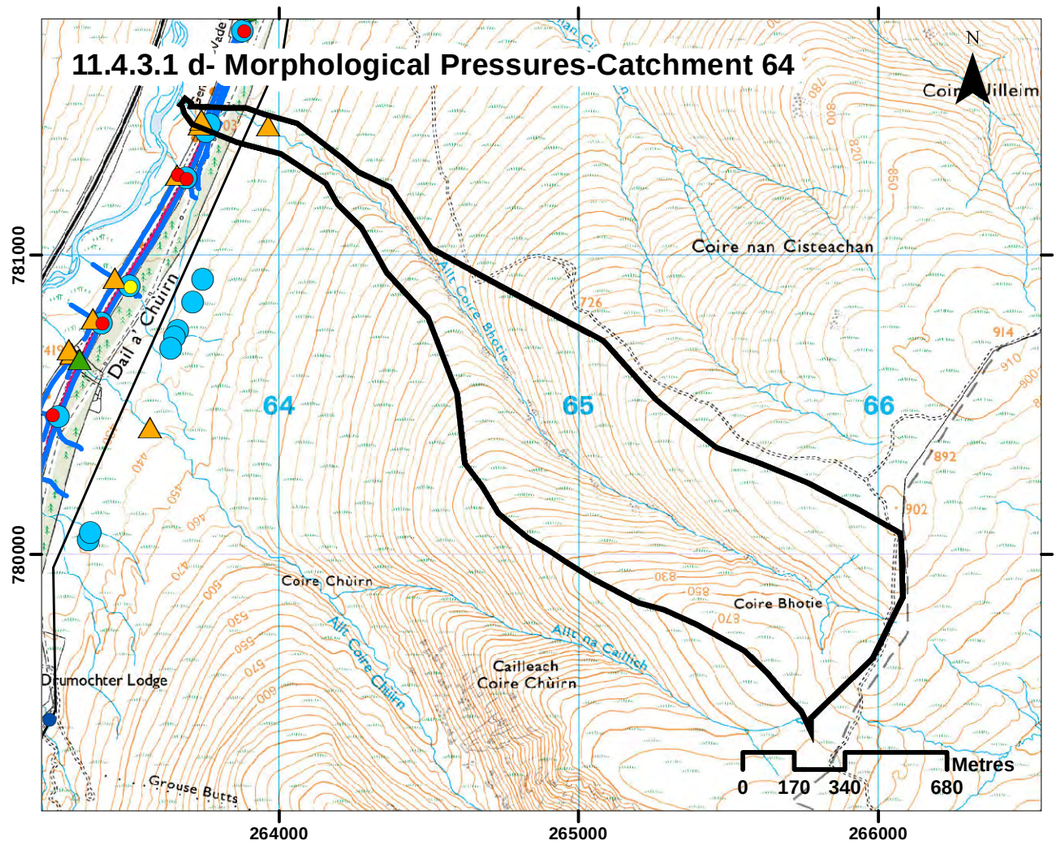
Photograph 11.4.3.105-Catchment upstream of crossing showing confined channel

Photograph 11.4.3.106-Downstream towards crossing









Legend

General
- Crossing location

Solid Geology
- Gaick Psammite Formation - Psammite

Drift Geology
- Peat
- Glaciofluvial Ice Contact Deposits
- Gaick Plateau Moraine Formation
- Hummocky Glacial Deposits
- Ardverikie Till Formation - Diamicton
- Glaciofluvial Sheet Deposits
- Alluvium
- River Terrace Deposits
- Alluvial Fan Deposits
- Head
- Talus - Rock Fragments
- Talus Cone

Environmental Designations
- Special Site of Scientific Interest
- Special Area of Conservation
- Special Protection Area

Morphological Pressures
- Road Bridge
- Track/Footbridge
- Culvert
- Cascade
- Step in Bed
- Catchpit
- Ford
- Drainage Ditch
- Power Lines

REV	SUIT	DATE	DESCRIPTION	BY	APP

CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

Drawing 11.4.3.1 Catchment 64 Catchment Overview

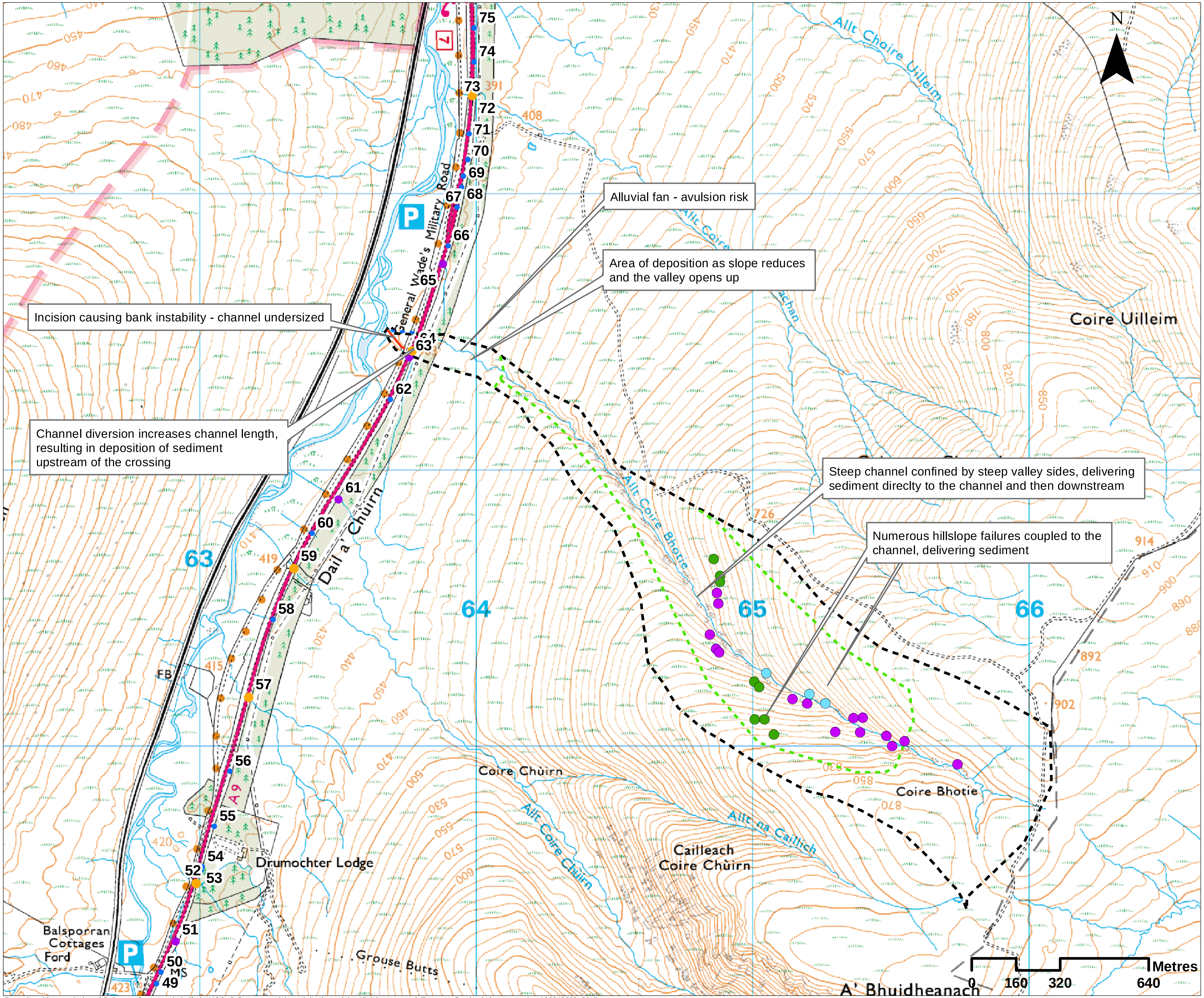
DESIGN:	DRAWN:	CHK:	APP:
EL	EV	EL	EL

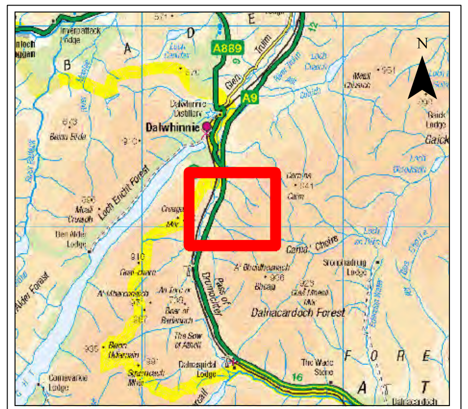
DATE: 18/07/2017

PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0001

SHEET:	REVISION:	SUITABILITY:
1 of 1	C01	S3





Legend

- Major crossing
- Minor crossing
- Other crossing
- Coupled debris flow
- Debris flow
- Valley side erosion
- Break in slope
- Original channel
- Incision
- Crossing catchment

REV	SUIT	DATE	DESCRIPTION	BY	APP

ch2m: FAIRHURST
CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

DRAWING 11.4.3.2. Catchment 64 Baseline Assessment

DESIGN: EL	DRAWN: EL	CHK: AB	APP: EL

DATE: 10/07/2017

PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0002

SHEET:	REVISION:	SUITABILITY:
1 OF 1	C01	A3

Annex 11.4.3 - Hydromorphological Catchment Assessment - Allt Beul an Sporain

Catchment No.	
Catchment Name	**Allt Beul an Sporain**

Channel Nature	Nature of water course	Natural
	Size of water course	Major

Quantitative Spatial Elements	Catchment Area (km^2)	N/A
	Average slope in catchment (°)	N/A
	% Catchment over 750m (for snow melt risk)	N/A

WFD classification	Water, flows and levels	Good
	Physical condition	Good
	Overall ecological status	Good

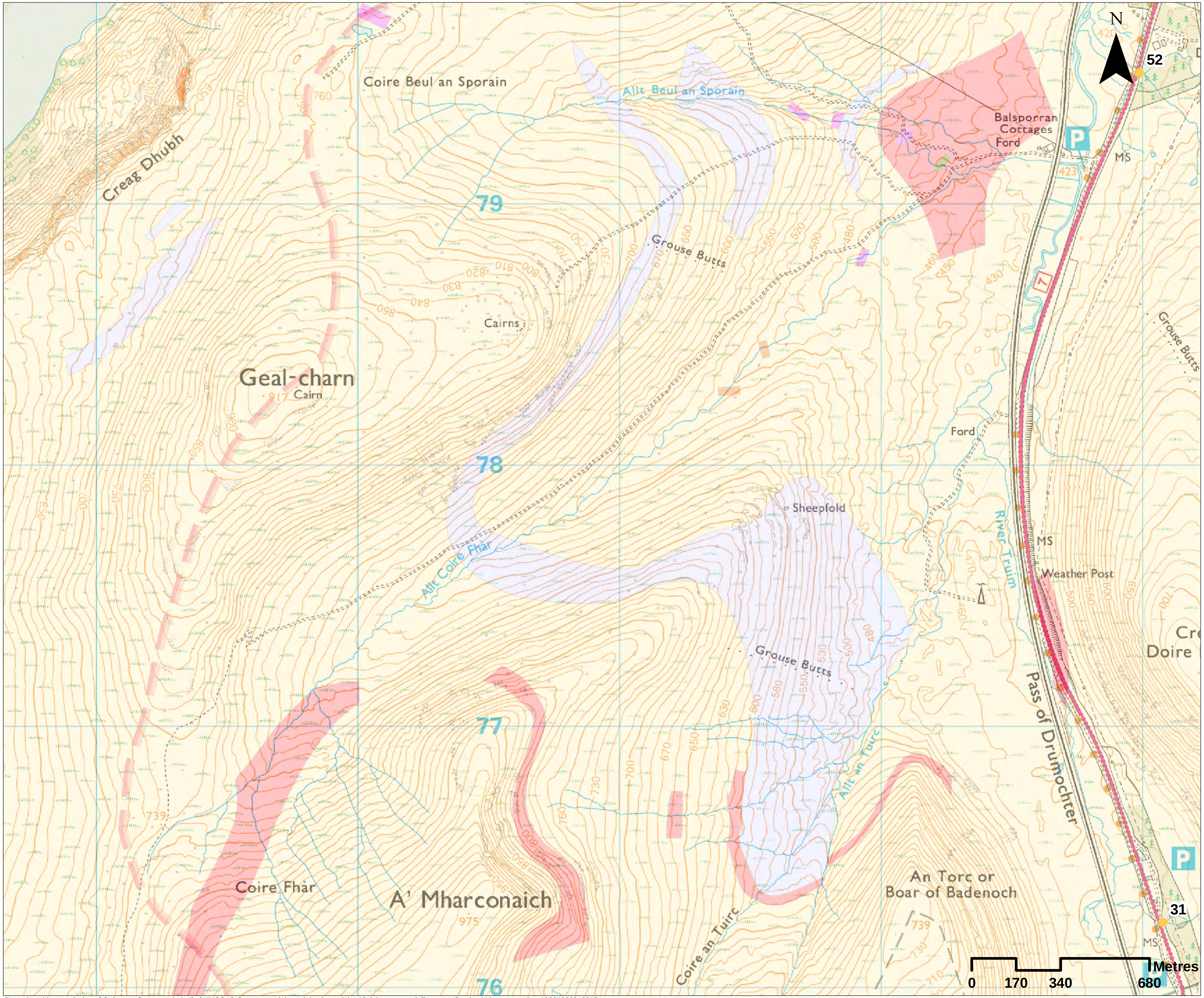
Geology	Majority Bedrock (see Drawing 11.4.3.1 a and b, Allt Beul an Sporain)	Gaick Psammite formation-Psammite	Resistant to weathering, impermeable
	Is an alluvial fan present at or near the crossing	N/A	

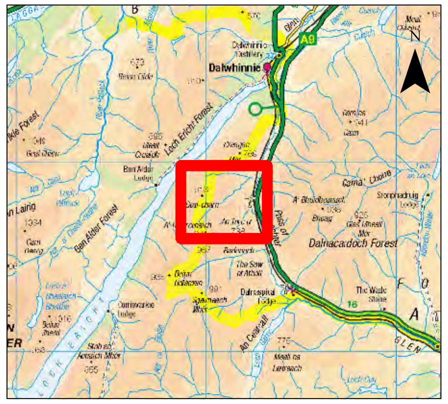
Environmental Designations	Ramsar	No	
	SAC	River Spey Drumochter Hills	Atlantic salmon, freshwater pearl mussel, otter, sea lamprey Acidic scree, alpine and subalpine heaths, blanket bog, dry heaths, monntane acid grasslands , mountain willow scrub, plants in crevices on acid rocks, species-rich grassland with mat-grass in upland areas, tall herb communities, wet heathland with cross-leaved
	SPA	Drumochter Hills	Dotterel breeding, merlin breeding
	SSSI	Drumochter Hills	Breeding bird assemblage, fluvial geomorphology of Scotland, montane assemblage, vascular plant assemblage

Sediment source and supply - Catchment Scale	Changes in slope and channel confinement	See Figure 11.4.3.2-Allt Beul an Sporain	
	Is peat present in the catchment	Yes	
	Is there a bog burst risk	Small	Within catchment
	Current valley side or terrace erosion	Yes	
	Potential valley side or terrace erosion	Yes	
	Hill slope failures (including peat slides and debris flows and slides)	Yes	
	Hill slope failures coupled to channel	Yes	
	Vertical incision present in catchment	Yes	
	Bank erosion/lateral migration	Yes	
	Unvegetated bars	Yes	Throughout main channel
	Wooded/forested areas in catchment	Very little	
	Comment on sediment source potential in catchment	There are extensive sediment sources within the catchment from the steep slopes and these are delivered to the main channel.	

Morphology and Process	Channel morphology	Plane-Riffle	Varied channel form and process, typical of the river type
	Predominant sediment size	Gravels	
	Unvegetated bars	Yes	
	Vertical incision	Medium	
	Deposition	High	
	Lateral migration/bank erosion	High	
	Infrastructure type	Railway crossing	
	Impact of infrastructure	Potentail to alter discharge and sediment inputs, casing a change in the natural process	
	Channel realignment	Straightened at confluence	

Summary behaviour	Steep valley sides directly supply sediment to the channel through a network of small tributaries and debris flows. Extensive areas of deposition and erosion within main channel suggesting that channel is mobile within the narrow floodplain.





Solid Geology

- Gaick Psammite Formation - Psammite
- Grampian Group - Psammite, Quartzose
- North Britain Siluro-Devonian Calc-Alkaline Dyke Suite - Felsite
- Scottish Highland Ordovician Minor Intrusion Suite - Pegmatite

REV	SUIT	DATE	DESCRIPTION	BY	APP

CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

Drawing 11.4.3.1a Allt Beul an Sporain Solid Geology

DESIGN: EL	DRAWN: CC	CHK: EL	APP: EL

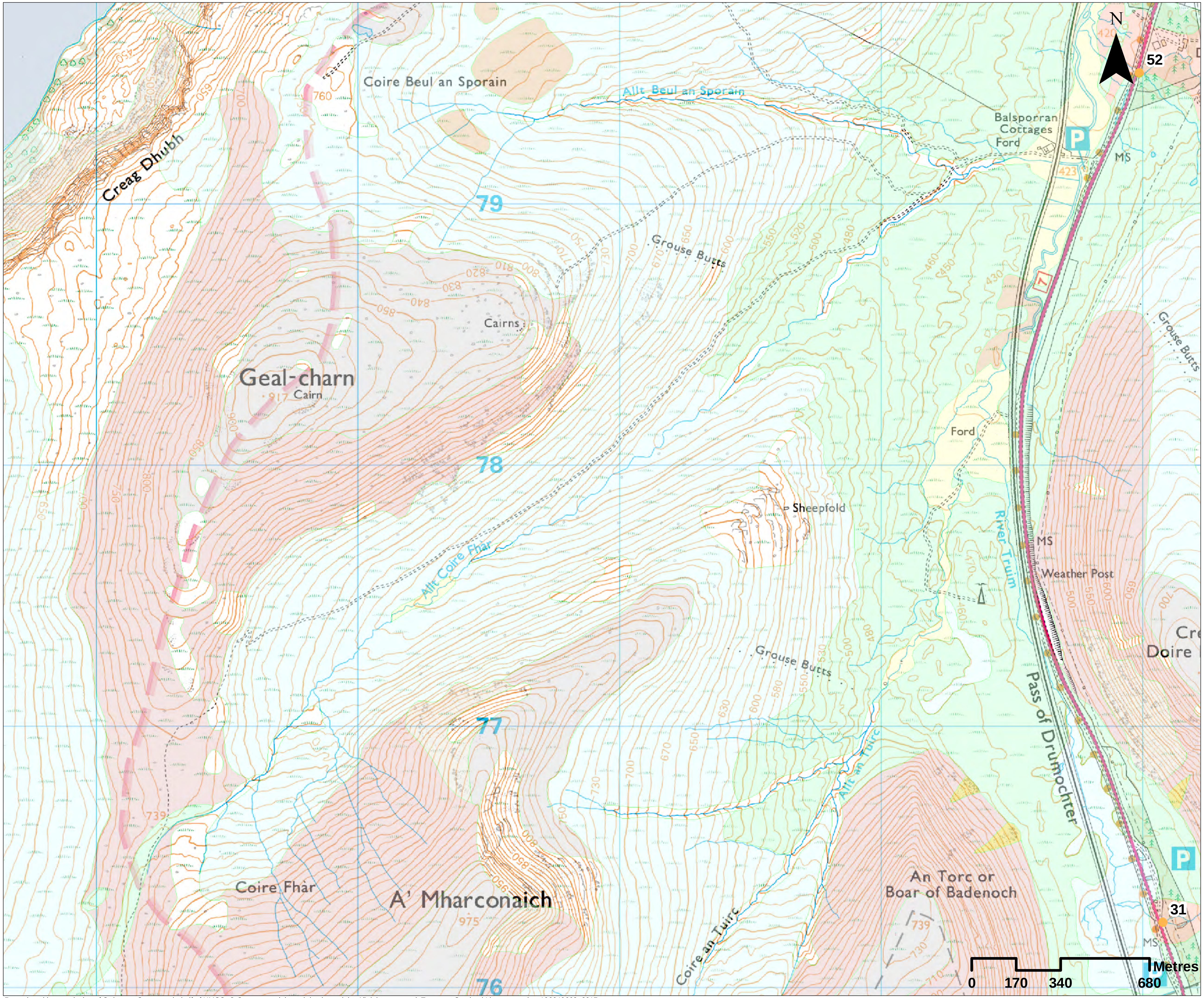
DATE: 27/07/2017

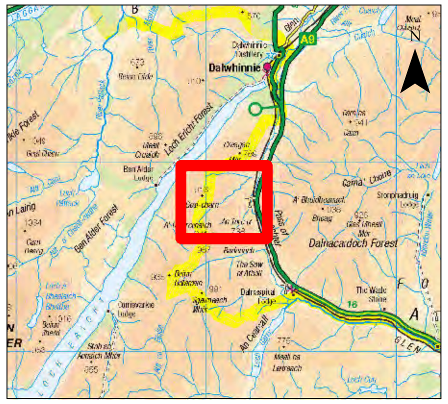
PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0001

SHEET: 1 OF 3	REVISION: C01	SUITABILITY: A3

Document Path: \\BHXFPP01\Proj\Transportation\TNXUGM - TQ Business Development\Small Projects\A9\GIS\Maps\Detailed assessment maps\Map 1 Pr7 Allt Beul an Sporain solid.mxd





Drift Geology

- Peat
- Glaciofluvial Ice Contact Deposits
- Gaick Plateau Moraine Formation
- Hummocky Glacial Deposits
- Ardverikie Till Formation - Diamicton
- Glaciofluvial Sheet Deposits
- Alluvium
- River Terrace Deposits
- Alluvial Fan Deposits
- Head
- Talus - Rock Fragments
- Talus Cone

REV	SUIT	DATE	DESCRIPTION	BY	APP

CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

Drawing 11.4.3.1b Allt Beul an Sporain Drift Geology

DESIGN: EL	DRAWN: CC	CHK: EL	APP: EL

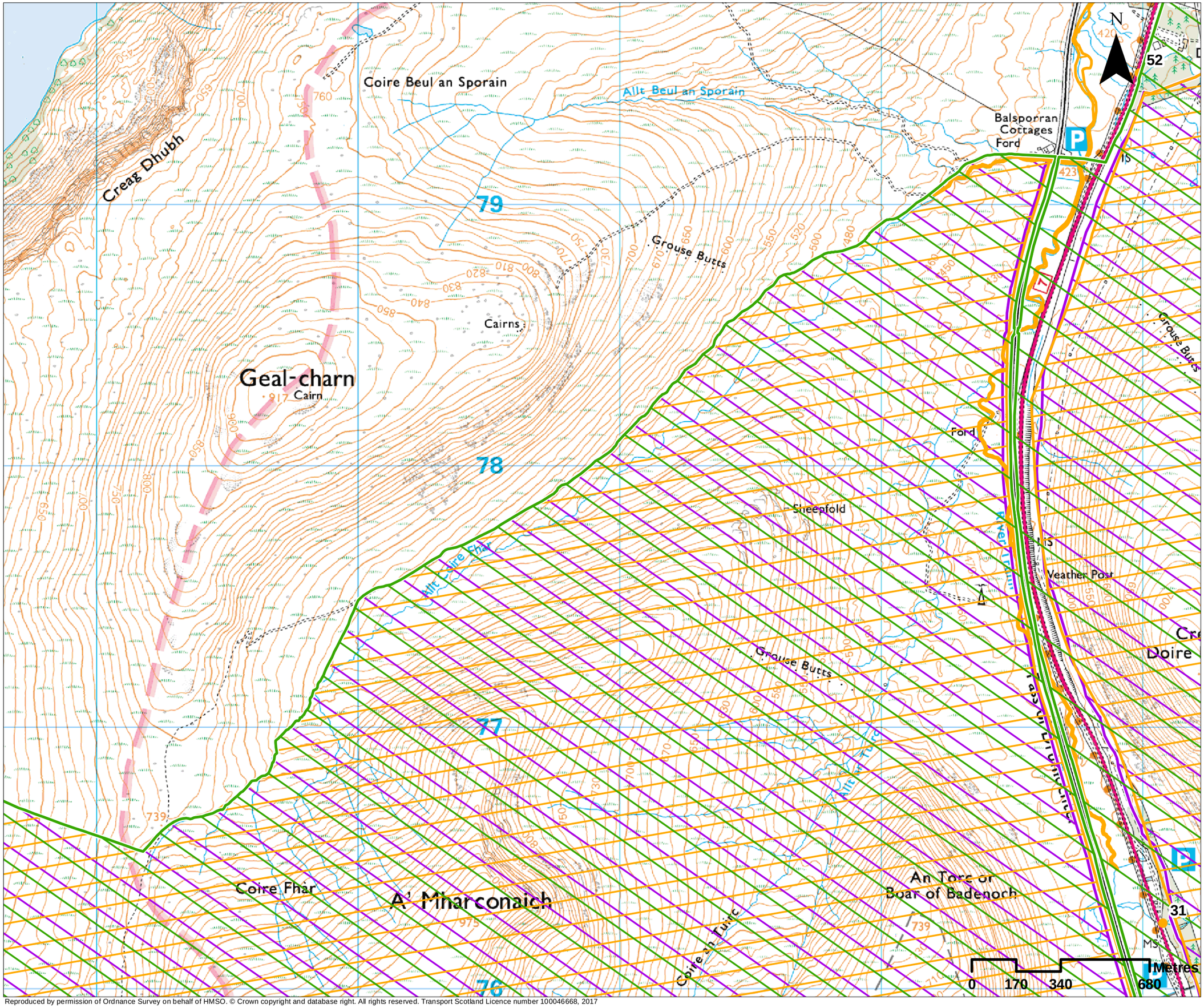
DATE: 27/07/2017

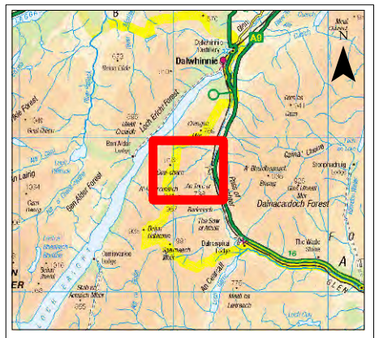
PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0001

SHEET: 2 OF 3	REVISION: C01	SUITABILITY: A3

Document Path: \\BHXFPP01\Proj\Transportation\TNXUGM - TQ Business Development\Small Projects\A9\GIS\Maps\Detailed assessment maps\Map 1 Pr7 Allt Beul an Sporain drift.mxd





Environmental Designations

- Special Site of Scientific Interest
- Special Area of Conservation
- Special Protection Area

REV	SUIT	DATE	DESCRIPTION	BY	APP

CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

Drawing 11.4.3.1c Allt Beul an Sporain Environmental Designations

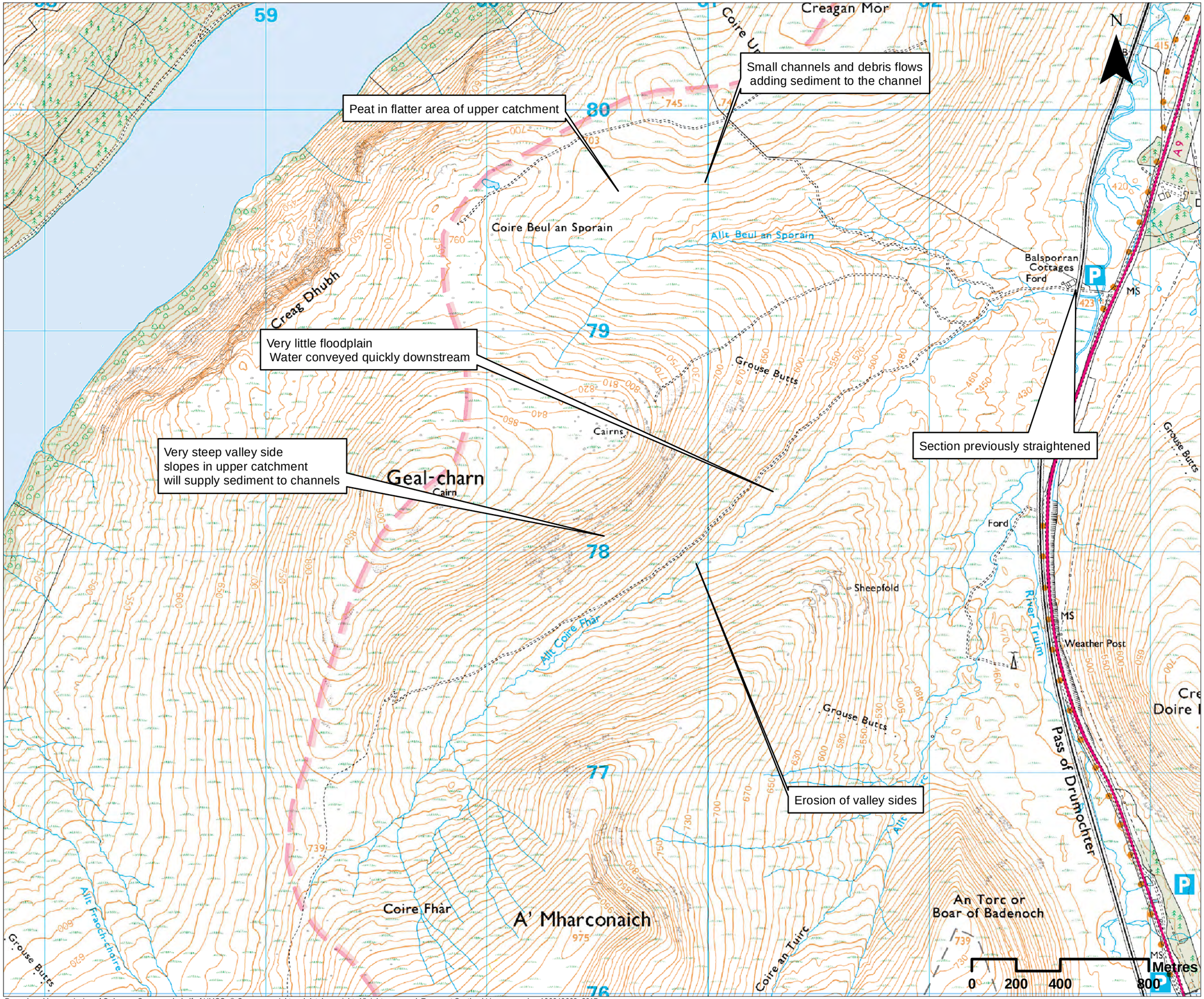
DESIGN:	DRAWN:	CHK:	APP:
EL	CC	EL	EL

DATE: 27/07/2017

PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0001

SHEET:	REVISION:	SUITABILITY:
3 OF 3	C01	A3



REV	SUIT	DATE	DESCRIPTION	BY	APP

CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

DRAWING 11.4.3.2.
Allt Beul an Sporain

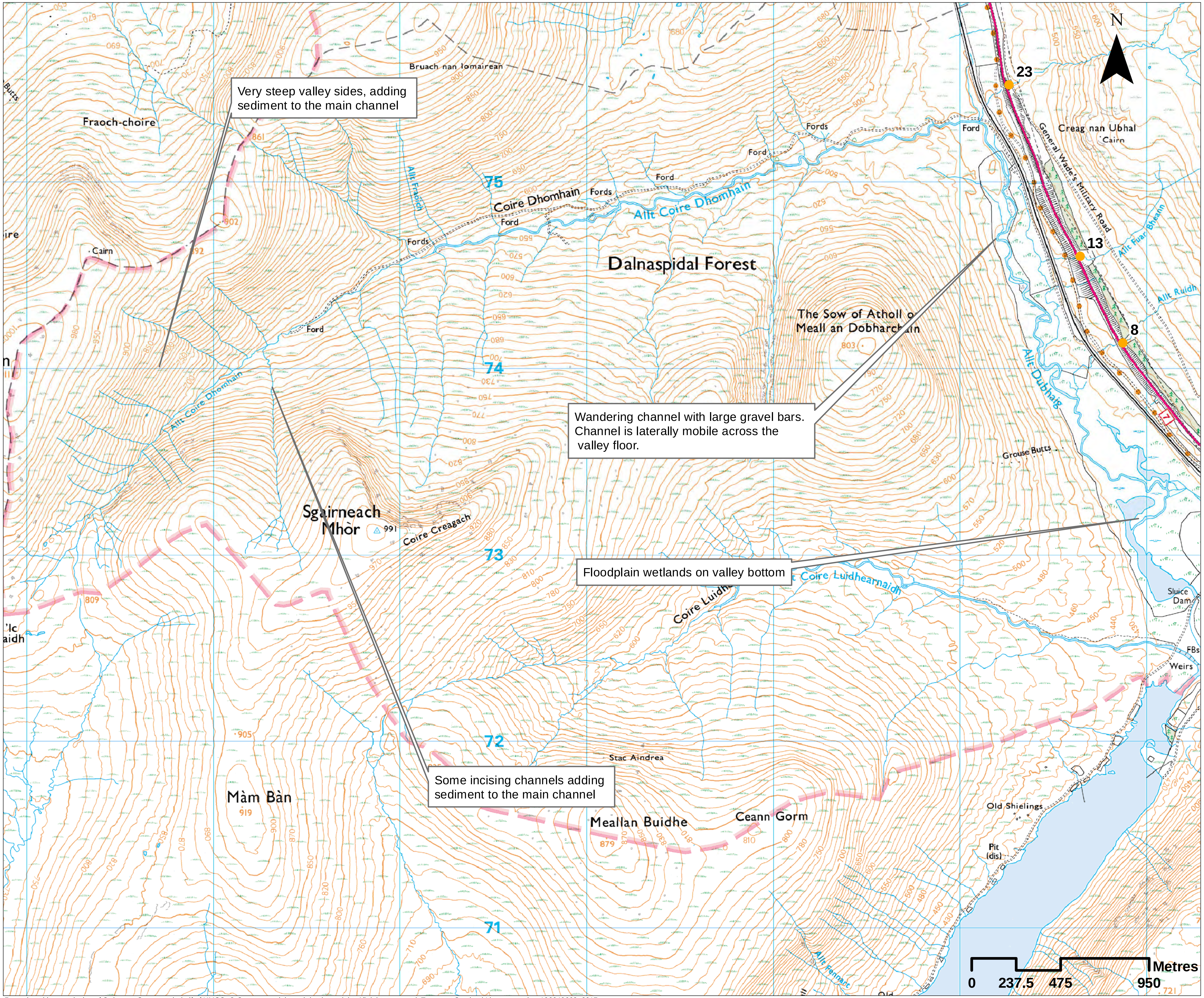
DESIGN:	DRAWN:	CHK:	APP:
EL	EL	AB	EL

DATE: 27/07/2017

PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0002

SHEET:	REVISION:	SUITABILITY:
1 OF 1	C01	A3



REV	SUIT	DATE	DESCRIPTION	BY	APP

ch2m: FAIRHURST

CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

TRANSPORT SCOTLAND — A9 DUALLING PERTH TO INVERNESS

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

Drawing 11.4.3.2 Allt Dubhaig Catchment baseline

DESIGN: EL	DRAWN: CC	CHK: EL	APP: EL

DATE: 18/07/2017

PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0002

SHEET: 1 OF 1	REVISION: C01	SUITABILITY: S3

Annex 11.4.3 - Hydromorphological Catchment Assessment - Truim

Catchment No.	
Catchment Name	**Truim**

Channel Nature	Nature of water course	Natural
	Size of water course	Major

Quantitative Spatial Elements	Catchment Area (km^2)	131
	Average slope in catchment (°)	N/A
	% Catchment over 750m (for snow melt risk)	N/A

WFD classification	Water, flows and levels	Good
	Physical condition	Good
	Overall ecological status	Good (River Truim from source to Allt Cuaich) Moderate (River Truim-lower catchment)

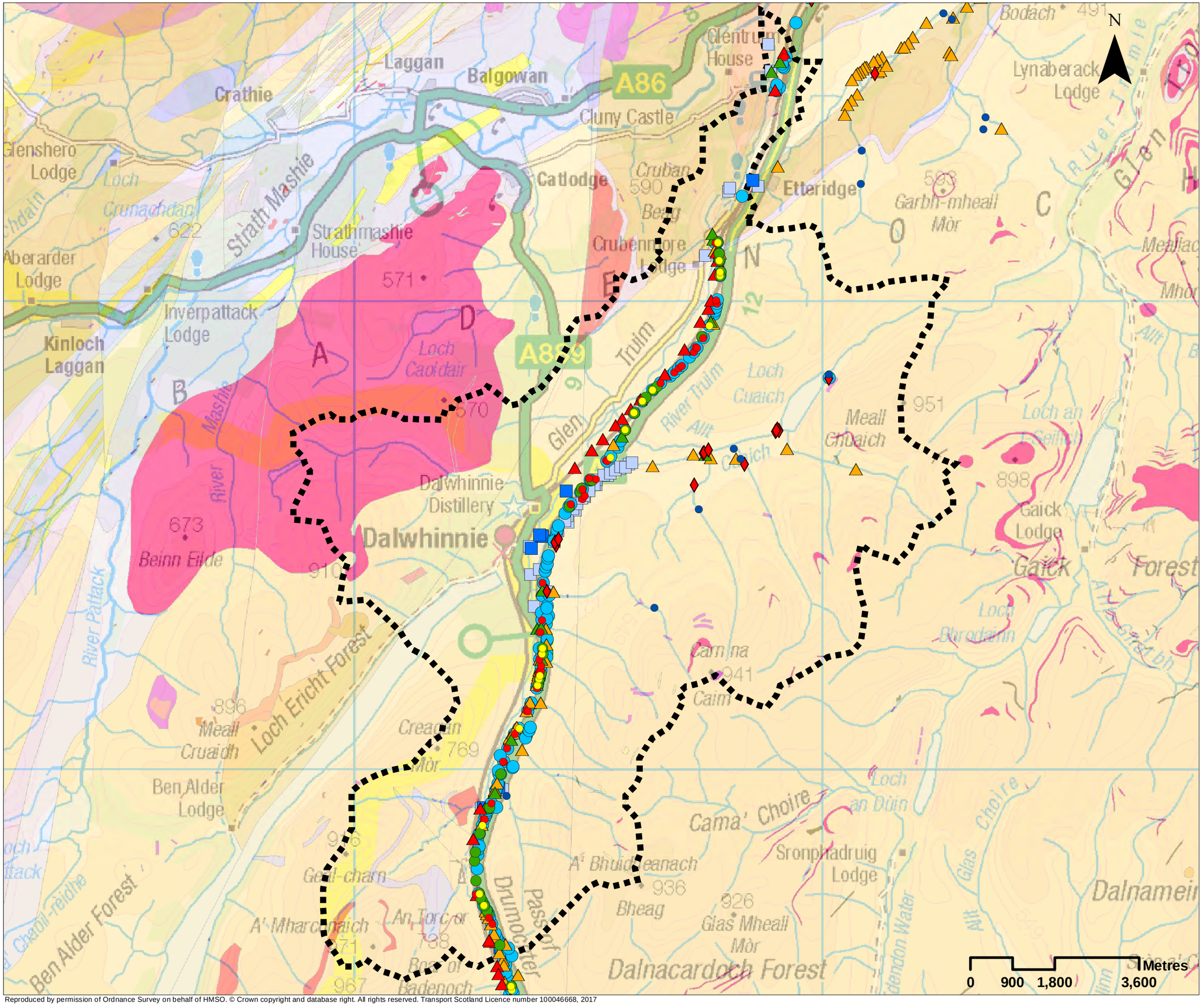
Geology	Majority bedrock	Gaick Psammite formation-Psammite	resistant to weathering, impermeable
	Majority Bedrock (see Drawing 11.4.3.1 a and b)	N/A	

Environmental designations (see Drawing 11.4.3.1 c)	Ramsar	No	
	SAC	Yes	**Drumochter Hills** - Acidic scree, alpine and subalpine heaths, blanket bog, dry heaths, montane acid grasslands , mountain willow scrub, plants in crevices on acid rocks, species-rich grassland with mat-grass in upland areas, tall herb communities, wet heathland with cross-leaved heath. **River Spey** - Atlantic salmon, freshwater pearl mussel, otter, sea lamprey
	SPA	Yes	**Drumochter Hills -** Dotterel breeding, merlin breeding
	SSSI	Yes	**Drumochter Hills -** Breeding bird assemblage, **fluvial geomorphology of Scotland**, montane assemblage, vascular plant assemblage

Sediment source and supply - Catchment Scale	Changes in slope and channel confinement	See Figure 11.4.3.2	
	Is peat present in the catchment	Yes	
	Is there a bog burst risk	Yes	Within catchment, but not with a direct impact on the Truim
	Current valley side or terrace erosion	Yes	
	Potential valley side or terrace erosion	Yes	
	Hill slope failures (including peat slides and debris flows and slides)	Yes	
	Hill slope failures coupled to channel	Yes	
	Vertical incision present in catchment	Yes	
	Bank erosion/lateral migration	Yes	Currently impacting on the road
	Unvegetated bars	Yes	Through main channel
	Wooded/forested areas in catchment	Yes	
	Comment on sediment source potential in catchment	There are extensive sediment sources within the Truim catchment, fro the steep slopes and these are delivered to the Truim from the steep tributaries. Some of this supply is currently reduced getting to the Truim by the undersized culverts, catchment pits etc. that form the A9, and by the SSE and Hydro power scheme.	

Morphology and Process	Channel morphology	Wandering	Varied channel form and process, typical of the river type
	Predominant sediment size	Gravels	
	Unvegetated bars	Yes	
	Vertical incision	Medium	
	Deposition	High	
	Lateral migration/bank erosion	High	At time at or close to the toe of the road embankment and railway embankment
	Infrastructure type (see Drawing 11.4.3.1 d)	Railway and Road, several bridges and culverts over tributaries. Aqueduct taking flow from catchment	
	Impact of infrastructure	Altering discharge and sediment inputs to the Truim, casing a change in the natural process, including channel narrowing	
	Channel realignment	Yes	Between the road and the railway in several locations

Summary behaviour	The Truim is an active channel, migrating laterally across its flood plain, however it has a number of pressures that are limiting the rate of this natural change. 22% of the River Truim catchment is regulated by a hydropower scheme initiated in the 1930's, and extended in the 1940's and 50's with most of the water abstracted going into Loch Ericht in the Tay catchment. Loch an t-Seilich has a compensation flow of 1.263m3/s released continuously down through the fish pass on the dam, with flows above this diverted to Loch Cuaich or spilled, and a flow of 0.684m3/s is released continuously down the Truim at Dalwhinnie through the fish pass on the intake (Enviro Centre, 2008). All of the bed load is trapped behind the diversion dams has historically been removed for the river system and stockpiled (Gilvear, 2004). As well as the Hydropower scheme the flow and sediment supply of the Truim are also impacted by the tributary crossings of the A9 and the Railway, where these are undersized and reducing flow and sediment supply to the main channel. There are also areas of bank protection along the channel to protect the railway and road embankments from erosion, as well as locations where bank protection may be required in the near future. Despite these pressures the morphology of the channel is varied and as expected for a channel of this type. There is little bank protection fixing the channel, and there is good channel floodplain connectivity.



Legend

- Railway Bridge
- Road Bridge
- Track/Footbridge
- Culvert
- Cascade
- Step in Bed
- Catchpit
- Ford
- Dam or Weir
- Discharge Location
- Abstraction Location
- Crossing catchment

REV	SUIT	DATE	DESCRIPTION	BY	APP

CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

Drawing 11.4.3.1a Truim Solid Geology

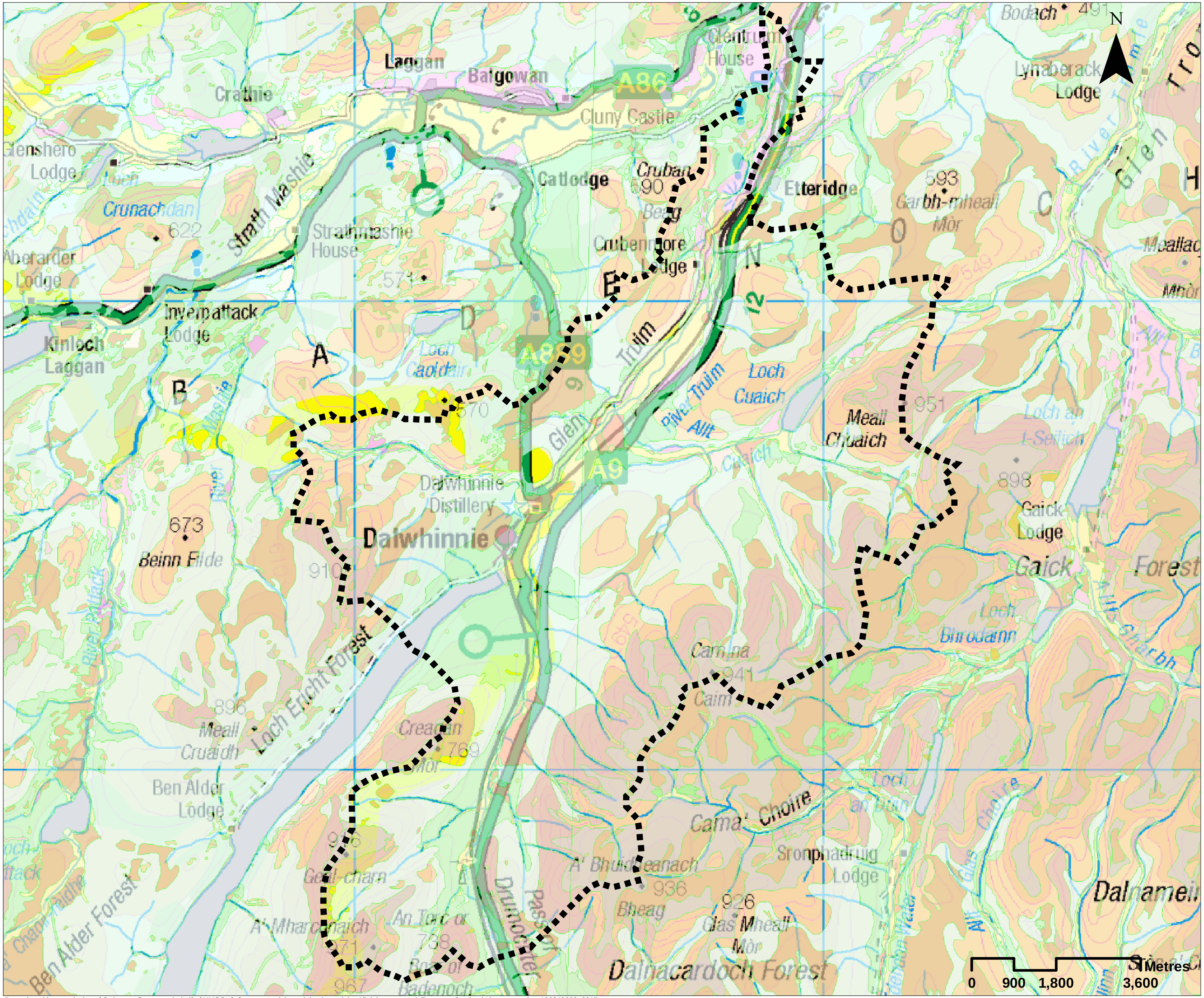
DESIGN:	DRAWN:	CHK:	APP:
EL	EV	EL	EL

DATE: 18/07/2017

PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0001

SHEET:	REVISION:	SUITABILITY:
2 OF 3	C01	A3



Legend

- Crossing catchment

Drift Geology

- Peat
- Glaciofluvial Ice Contact Deposits
- Gaick Plateau Moraine Formation
- Hummocky Glacial Deposits
- Ardverikie Till Formation - Diamicton
- Glaciofluvial Sheet Deposits
- Alluvium
- River Terrace Deposits
- Alluvial Fan Deposits
- Head
- Talus - Rock Fragments
- Talus Cone

REV	SUIT	DATE	DESCRIPTION	BY	APP

ch2m: FAIRHURST
CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

TRANSPORT SCOTLAND · A9 DUALLING PERTH TO INVERNESS

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

Drawing 11.4.3.1b Truim Drift Geology

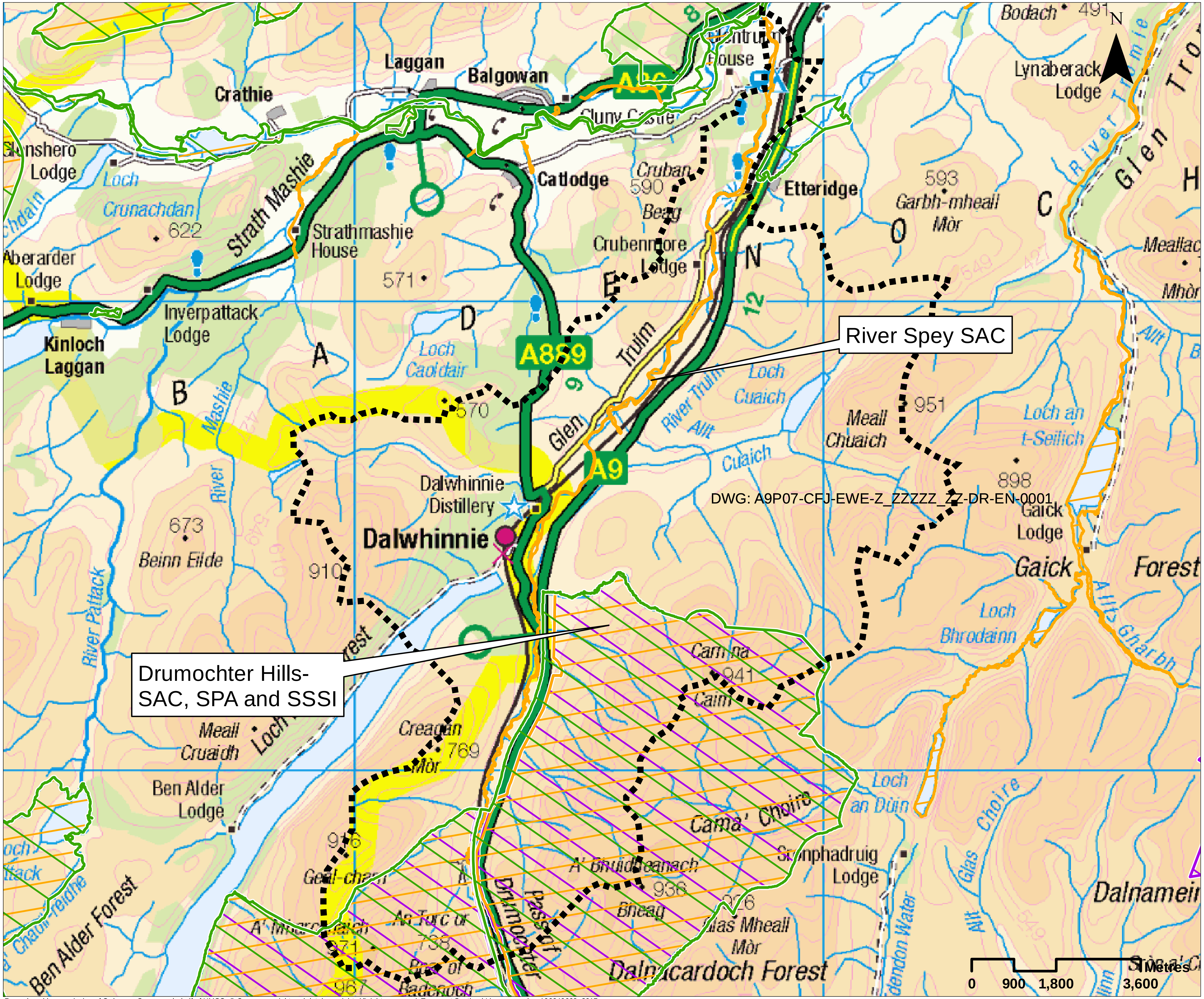
DESIGN: EL	DRAWN: EV	CHK: EL	APP: EL

DATE: 18/07/2017

PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0001

SHEET: 1 OF 3	REVISION: C01	SUITABILITY: A3



Legend

- Crossing catchment

Environmental Designations

- Special Site of Scientific Interest
- Special Area of Conservation
- Special Protection Area

REV	SUIT	DATE	DESCRIPTION	BY	APP

ch2m. FAIRHURST
CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

Drawing 11.4.3.1c Truim Designations

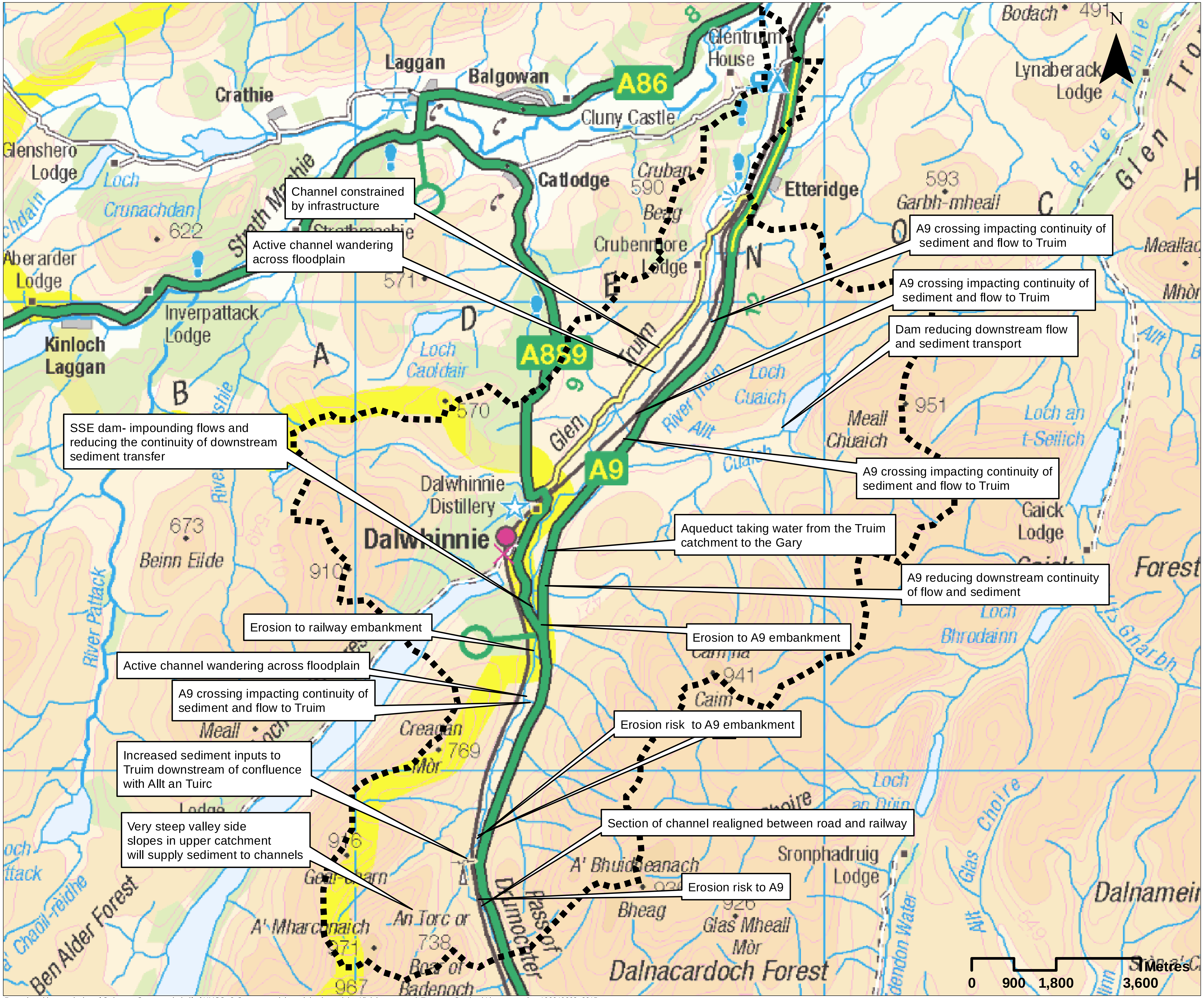
DESIGN: EL	DRAWN: EV	CHK: EL	APP: EL

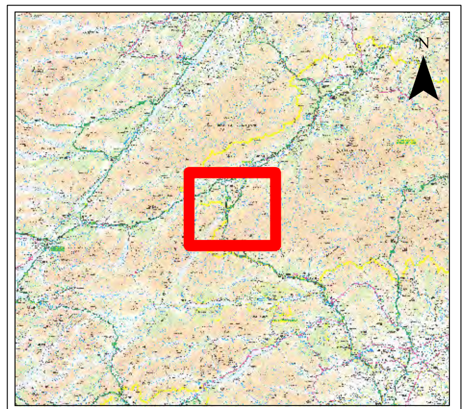
DATE: 18/07/2017

PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0001

SHEET: 3 OF 3	REVISION: C01	SUITABILITY: A3





Legend

Crossing catchment

REV	SUIT	DATE	DESCRIPTION	BY	APP

CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

DRAWING 11.4.3.2.
River Truim Baseline Assessment

DESIGN:	DRAWN:	CHK:	APP:
EL	EL	AB	EL

DATE: 27/07/2017

PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0002

SHEET:	REVISION:	SUITABILITY:
1 OF 1	C01	A3

Document Path: \\BHXFPP01\Proj\Transportation\TNXUGM - TQ Business Development\Small Projects\A9\GIS\Maps\Detailed assessment maps\P07 Assessment Truim.mxd

Annex 11.4.3 - Hydromorphological Catchment Assessment - Allt Dubhaig

Catchment No.	**Allt Dubhaig (Allt Coire Dhomhain for WFD)**
Catchment Name	

Channel Nature	Nature of water course	Natural
	Size of water course	Major

Quantitative Spatial Elements	Catchment Area (km^2)	N/A
	Average slope in catchment (°)	N/A
	% Catchment over 750m (for snow melt risk)	N/A

WFD classification	Water, flows and levels	Good
	Physical condition	High
	Overall ecological status	Poor

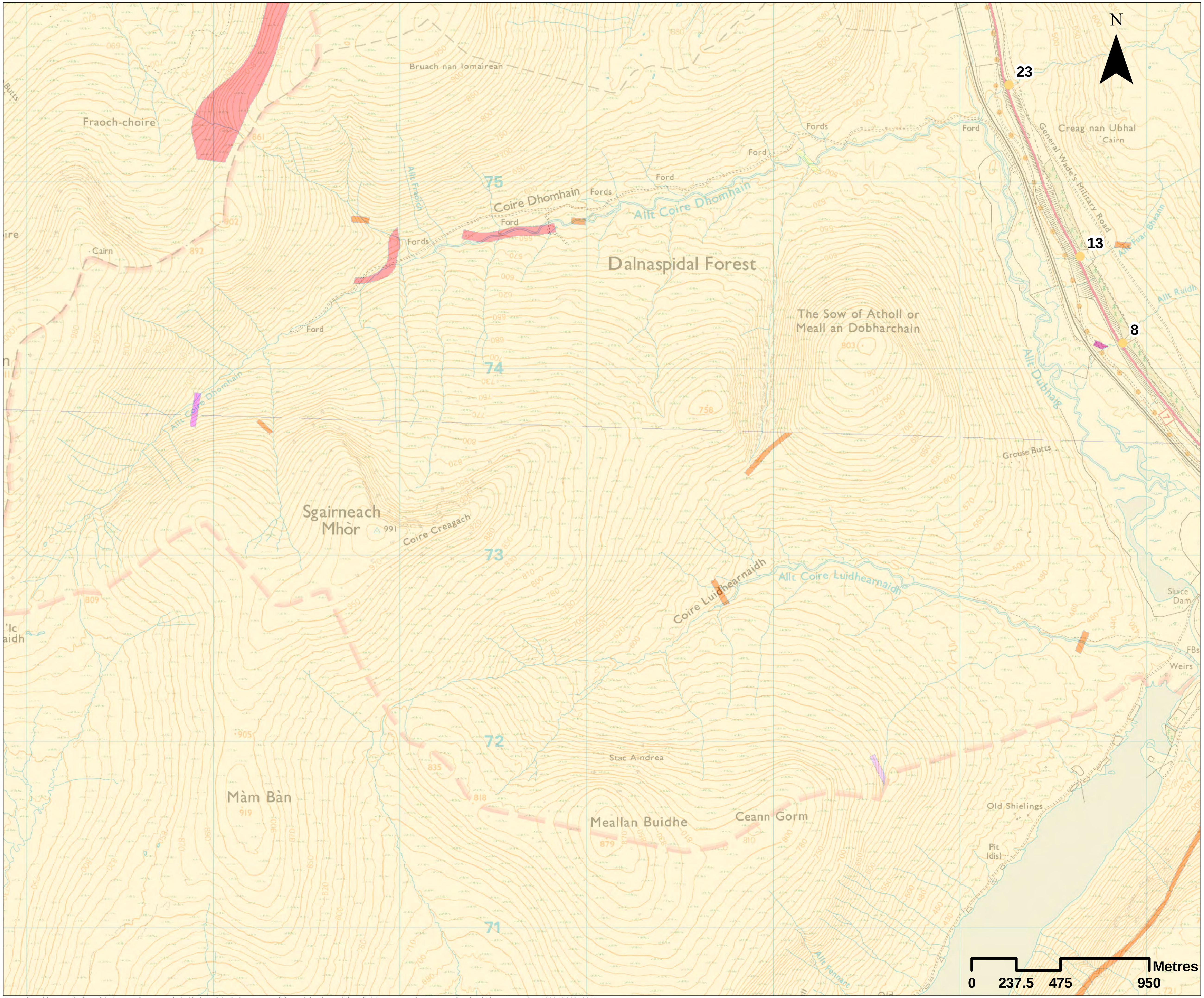
Geology	Majority bedrock	Gaick Psammite formation-Psammite	Resistant to weathering, impermeable
	Majority Bedrock (see Drawing 11.4.3.1 a and b, Allt Dubhaig)	N/A	

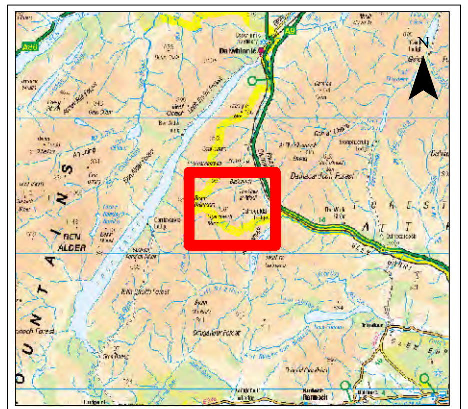
Environmental Designations	Ramsar	No	
	SAC	Drumochter Hills	Acidic scree, alpine and subalpine heaths, blanket bog, dry heaths, monntane acid grasslands , mountain willow scrub, plants in crevices on acid rocks, species-rich grassland with mat-grass in upland areas, tall herb communities, wet heathland with cross-leaved
	SPA	Drumochter Hills	Dotterell breeding, merlin breeding
	SSSI	Drumochter Hills	Breeding bird assemblage, fluvial geomorphology of Scotland, montane assemblage, vascular plant assemblage

Sediment source and supply - Catchment Scale	Changes in slope and channel confinement	See Figure 11.4.3.2	
	Is peat present in the catchment	Yes	
	Is there a bog burst risk	Small	Within catchment
	Current valley side or terrace erosion	Yes	
	Potential valley side or terrace erosion	Yes	
	Hill slope failures (including peat slides and debris flows and slides)	Yes	
	Hill slope failures coupled to channel	Yes	
	Vertical incision present in catchment	Yes	
	Bank erosion/lateral migration	Yes	
	Unvegetated bars	Yes	Throughout main channel
	Wooded/forested areas in catchment	Small	
	Comment on sediment source potential in catchment	There are extensive sediment sources within the catchmentfrom the steep slopes and these are delivered to the main channel through the tributaries. Some of this supply is currently reduced getting to the Allt Dubhaig by the undersized culverts, catchment pits etc. that form the A9	

Morphology and Process	Channel morphology	Wandering	Varied channel form and process, typical of the river type
	Predominant sediment size	Gravels	
	Unvegetated bars	Yes	
	Vertical incision	Medium	
	Deposition	High	
	Lateral migration/bank erosion	High	
	Infrastructure type (see Drawing 11.4.3.1 d)	Railway and Road, several bridges and culverts over tributaries	
	Impact of infrastructure	Altering discharge and sediment inputs, casing a change in the natural process	
	Channel realignment	N/A	N/A

Summary behaviour	The Allt Dubhaig is an active, wandering channel. There are many steep tributaries adding sediment to the main stem through incision, valley side erosion and the transportation of debris flows. The river is varied in form and process.





Solid Geology

- Gaick Psammite Formation - Psammite
- Grampian Group - Psammite, Quartzose
- North Britain Siluro-Devonian Calc-Alkaline Dyke Suite - Felsite
- Scottish Highland Ordovician Minor Intrusion Suite - Pegmatite

REV	SUIT	DATE	DESCRIPTION	BY	APP

ch2m· FAIRHURST
CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

TRANSPORT SCOTLAND

A9 DUALLING PERTH TO INVERNESS

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

Drawing 11.4.3.1a Allt Dubhaig, Solid Geology

DESIGN:	DRAWN:	CHK:	APP:
EL	CC	EL	EL

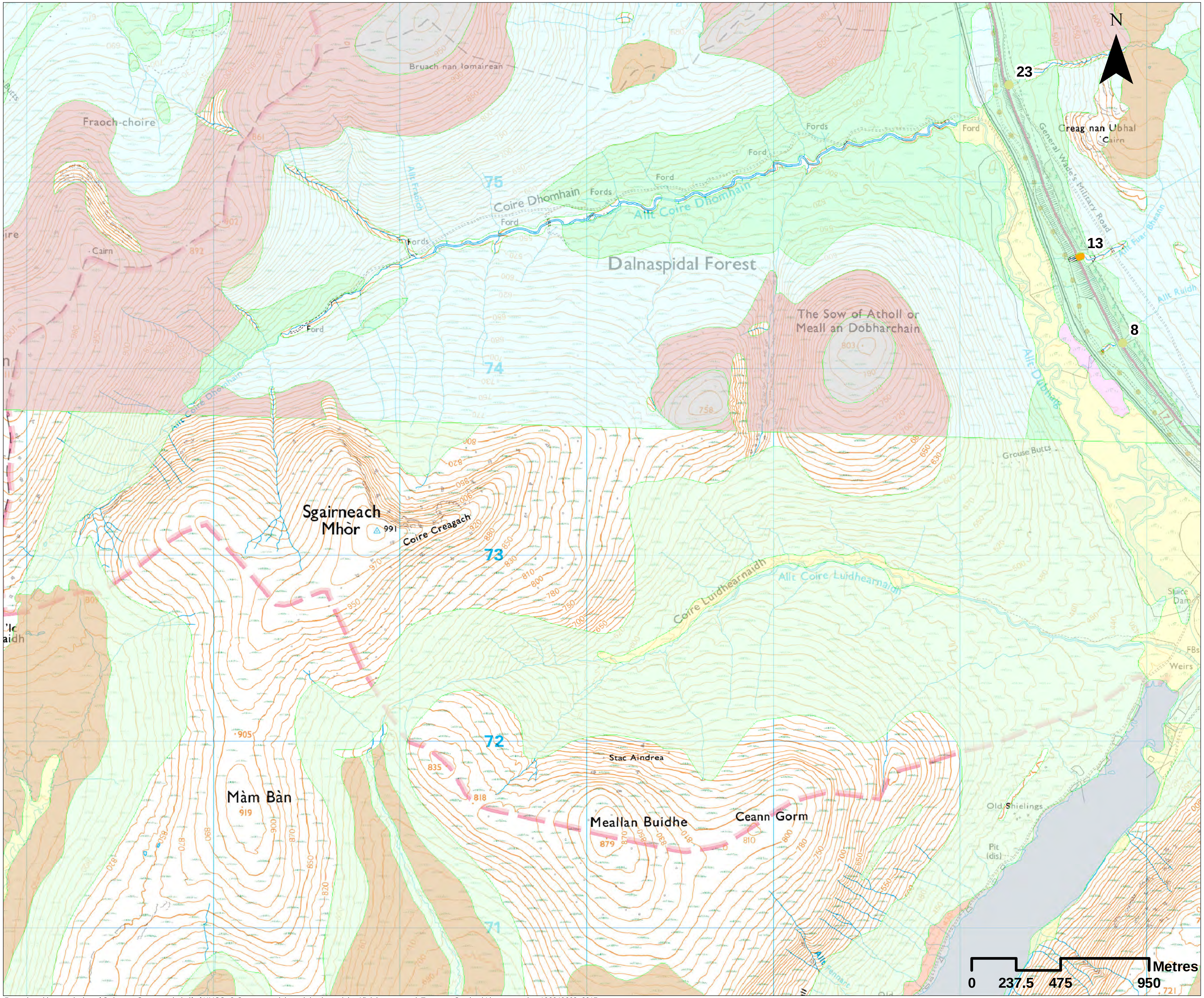
DATE: 18/07/2017

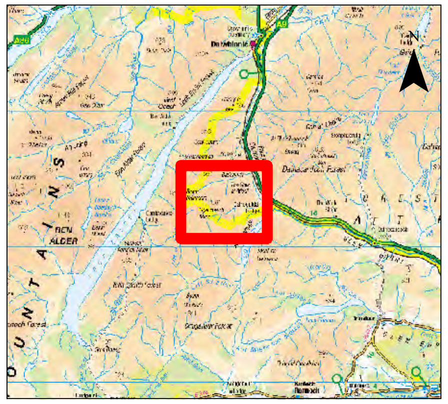
PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0001

SHEET:	REVISION:	SUITABILITY:
1 OF 3	C01	A3

Document Path: \\BHKFPP01\Proj\Transportation\TNXUGM - TQ Business Development\Small Projects\A9\GIS\Maps\Detailed assessment maps\Map 1 mxds\Map 1 P7 Dubhaig Solid.mxd





Drift Geology

- Peat
- Glaciofluvial Ice Contact Deposits
- Gaick Plateau Moraine Formation
- Hummocky Glacial Deposits
- Ardverikie Till Formation - Diamicton
- Glaciofluvial Sheet Deposits
- Alluvium
- River Terrace Deposits
- Alluvial Fan Deposits
- Head
- Talus - Rock Fragments
- Talus Cone

REV	SUIT	DATE	DESCRIPTION	BY	APP

ch2m: FAIRHURST
CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

TRANSPORT SCOTLAND
A9 DUALLING PERTH TO INVERNESS

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

Drawing 11.4.3.1b Allt Dubhaig, Drift Geology

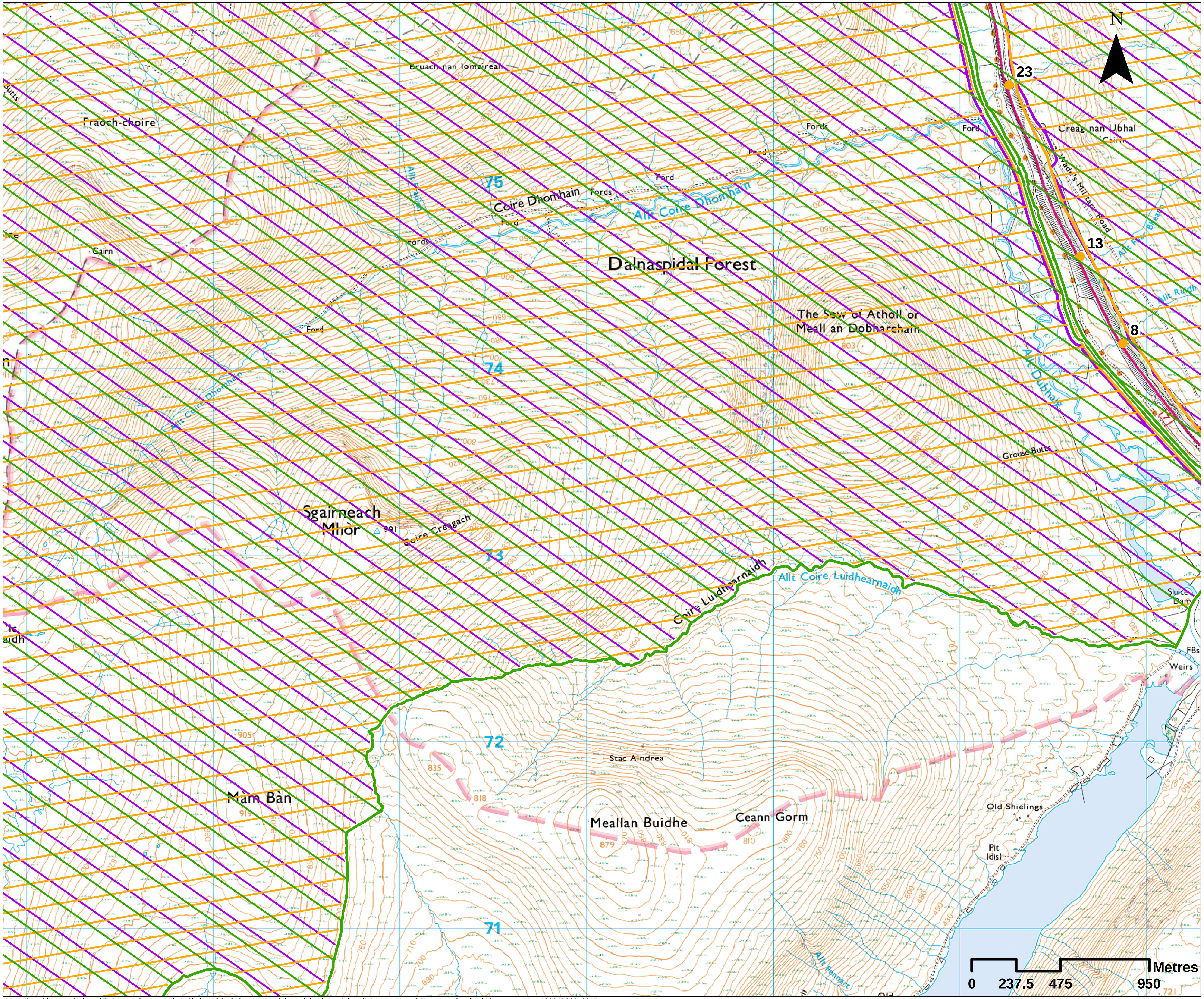
DESIGN:	DRAWN:	CHK:	APP:
EL	CC	EL	EL

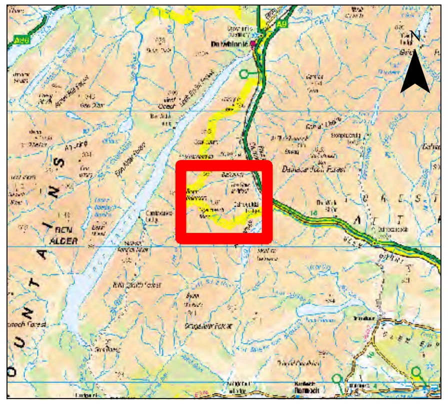
DATE: 18/07/2017

PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0001

SHEET:	REVISION:	SUITABILITY:
2 OF 3	C01	A3





Environmental Designations

- Special Site of Scientific Interest
- Special Area of Conservation
- Special Protection Area

REV	SUIT	DATE	DESCRIPTION	BY	APP

ch2m: FAIRHURST

CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

Transport Scotland
A9 Dualling Perth to Inverness

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

Drawing 11.4.3.1c Allt Dubhaig
Environmental Designations

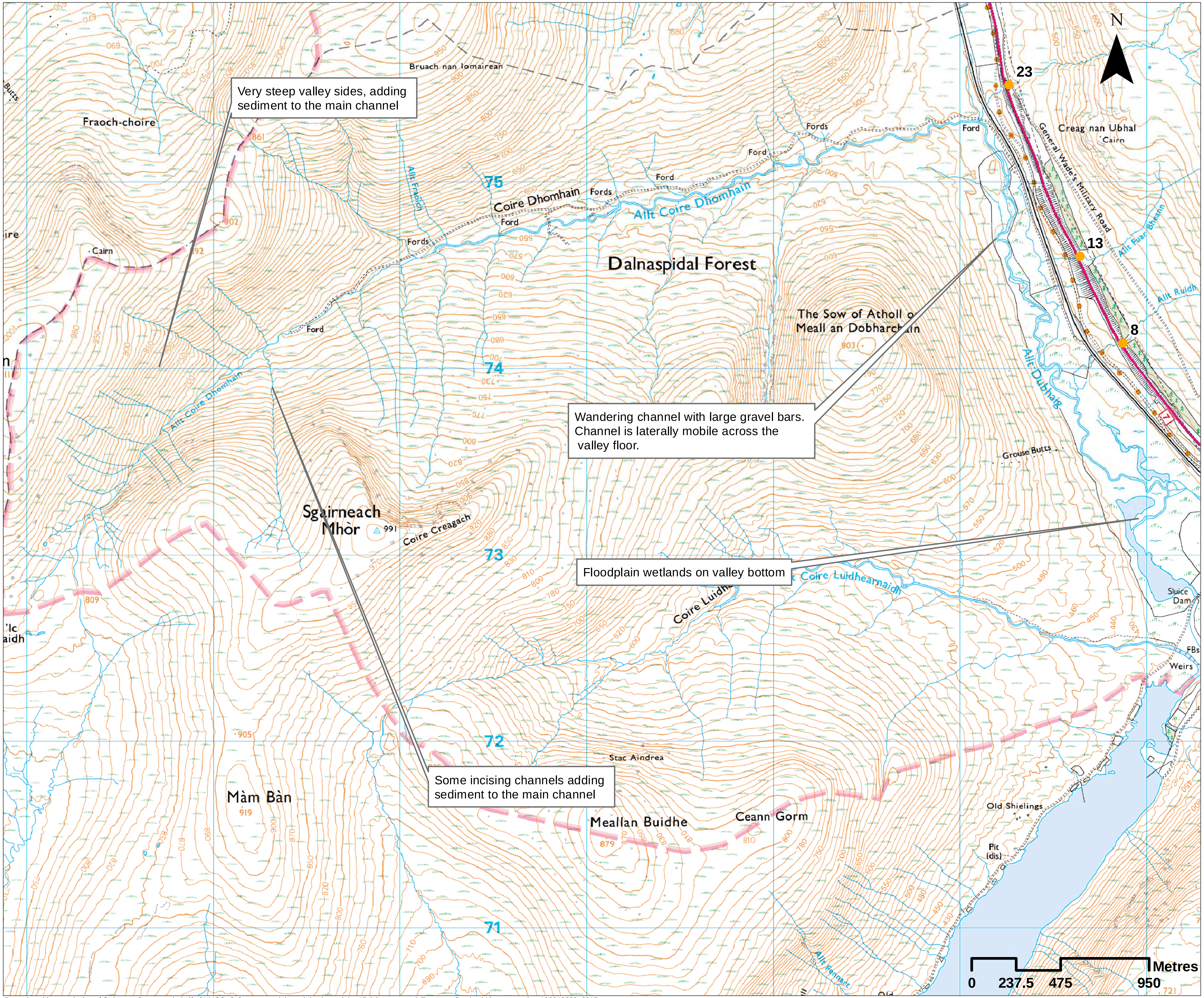
DESIGN:	DRAWN:	CHK:	APP:
EL	CC	EL	EL

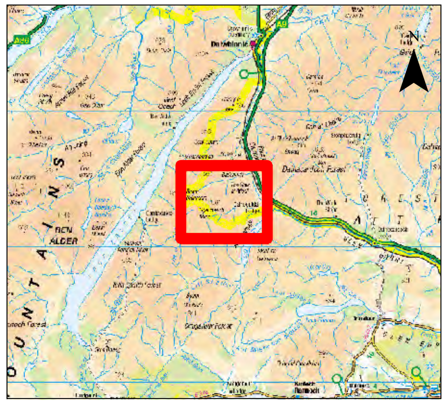
DATE: 18/07/2017

PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0001

SHEET:	REVISION:	SUITABILITY:
3 OF 3	C01	A3





REV	SUIT	DATE	DESCRIPTION	BY	APP

ch2m: FAIRHURST
CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

TRANSPORT SCOTLAND — A9 DUALLING PERTH TO INVERNESS

PROJECT 7 GLEN GARRY TO DALWHINNIE EIA

Drawing 11.4.3.2 Allt Dubhaig Catchment baseline

DESIGN:	DRAWN:	CHK:	APP:
EL	CC	EL	EL

DATE: 18/07/2017

PROJ: 495298

DWG: A9P07-CFJ-EWE-Z_ZZZZZ_ZZ-DR-EN-0002

SHEET:	REVISION:	SUITABILITY:
1 OF 1	C01	S3