

A14.4 Impact Assessment Tables

1. Introduction

- 1.1.1 This appendix details the potential impacts of each route option prior to mitigation in relation to the assessment reported in DMRB Stage 2 Scheme Assessment Report, Part 3: Environmental Assessment, Chapter 14 (Road Drainage and the Water Environment).
- 1.1.2 Potential impacts during both the construction and operational phases are summarised for each attribute of a surface water feature (SWF) in Table 1 and Table 2 respectively. Those with a significance of impact greater than Moderate are discussed further in Chapter 14 (Road Drainage and Water Environment).
- 1.1.3 All of the impacts that are reported in Table 1 and 2 are adverse unless otherwise stated.
- 1.1.4 In the operational impacts table, it should be noted that where an outfall has passed the assessment for soluble pollutants but received an 'Alert' for sediment-bound pollutants, the potential magnitude of impact for the attribute's 'biodiversity' and 'water quality/supply' is shown as minor adverse, not negligible. This is to highlight that there could be a potential impact if no mitigation was provided for settlement of sediments.

Table 1: Summary of Impacts on SWFs during Construction and Potential Mitigation

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
SWF 01: Mill Burn							
All options: no potential impacts identified for this surface water feature.	Hydrology and Flood Risk	Drains a relatively small sized catchment. Receives water from at least two direct tributaries. The watercourse is within PVA 01/21. Receptors: <ul style="list-style-type: none"> >100 residential properties; Commercial areas; Local road network; Farm land; and Golf course. 	Very High	All options	Negligible	Neutral	Construction Environmental Management Plan (CEMP) to include method statement and details of any temporary drainage systems proposed to control runoff from construction areas; alleviate localised flood risk and prevent obstruction of surface runoff.
SWF 02: Inshes Burn							
All options: Construction of carriageway near SWF. Potential for temporary increase in hardstanding areas and soil compaction during construction works to result in temporary increased runoff rates in to the water feature. Construction of outfall into SWF. Temporary construction works for SUDS system within catchment may slightly increase peak flow rates into watercourse. Options 1A, 1B, 2A and 2B: Construction of a culvert. Temporary construction structures placed within flood risk zone or for flow diversion of the water feature may temporarily increase flood risk	Hydrology and Flood Risk	Drains a small catchment. Receives water from at least three direct tributaries. Receptors: <ul style="list-style-type: none"> Approx 100 residential properties including some near Inshes Retail Park identified as particularly flood-sensitive by consultation responses; Raigmore Hospital; A9; Inverness Retail and Business Park; Local road network; and Farm land. 	Very High	Options 1A, 1B, 2A, 2B	Major	Very Large	Refer to mitigation recommended for SWF 01.
				Option 3A, 3B	Moderate	Large	

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
locally and be susceptible to flood damage. Construction of channel realignment. Potential temporary increase in flood risk locally due to constrictions in flow due to in channel working and potential loss of flood plain area during works.							
All options: Temporary increase in fine sediment as a result of construction of carriageway Options 1A, 1B, 2A and 2B: Temporary increase in fine sediment as a result of construction of a culvert, an outfall, and part channel realignment. Diversion/damming of flow during in-channel works to construct culvert/outfall/realignment.	Fluvial geomorphology	Straightened channel choked with vegetation, extensively realigned with a trapezoidal cross section and reinforced banks. The channel was culverted under several roads.	Low	All options	Moderate	Slight	Implement appropriate control measures for site runoff and sedimentation. Follow SEPA approved construction methods, conduct in-channel works during low flow and limit the extent of disturbance.
Change in water quality due to potential siltation, pollution runoff, spillages, erosion and sedimentation as a result of: All options: construction of carriageway and outfall. Options 1A, 1B, 2A and 2B: additional construction of a culvert, and part channel realignment.	Water quality/supply	Not classified under WFD. 'Good' water quality assumed. Surrounding land-use: urban, residential and agriculture; forestry upstream. No licensed water abstractions identified in SEPA data.	High	All options	Major	Large	Develop Pollution Prevention Plan, including spillage response measures, prior to construction. Prepare appropriate Method Statements for working with and storing oils and chemicals in line with the requirements of the Water Environment (Oil Storage) (Scotland) Regulations 2006. Contractor to prepare and implement a Construction Environmental Management Plan (CEMP), to be approved by SEPA prior to commencement of works. Design an Environmental Incident Control Plan (EICP) to ensure protective measures are
	Dilution and removal of waste products	CAR licence for combined sewer overflow from residential property. Potential additional pollutant sources: road and railway drainage and diffuse urban/rural sources.	High	All options	Major	Large	
	Biodiversity	WFD overall ecological status: not classified. 'Moderate' equivalent assumed. Fisheries status: not designated.	Medium	All options	Major	Large	

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
							<p>implemented to deal with both normal and emergency situations. Follow SEPA's pollution prevention guidance.</p> <p>Installation of temporary treatment facilities, in agreement with SEPA and CIRIA C697 guidance.</p> <p>Develop a permanent drainage system early in construction. Apply for CAR licences under the requirements of the CAR Regulations.</p>
SWF 03: Tributary of Scretan Burn (1)							
<p>All options: Construction of carriageway near SWF: Potential for temporary increase in hardstanding areas and soil compaction during construction works to result in temporary increased runoff rates in to the water feature.</p> <p>Construction of a culvert. Temporary construction structures placed within flood risk zone or for flow diversion of the water feature may temporarily increase flood risk locally and be susceptible to flood damage.</p> <p>Construction of outfall into SWF. Temporary construction works for SUDS system within catchment may slightly increase peak flow rates into watercourse.</p> <p>Options 2A and 2B: Construction of channel realignment. Potential temporary increase in flood risk locally due to constrictions in flow</p>	Hydrology and Flood Risk	<p>Drains a small catchment. Receptors:</p> <ul style="list-style-type: none"> • More than 10 residential properties, including some at Inshes Smallholdings identified as particularly flood-sensitive by consultation responses; • A9; • Local road network; • Highland Main Line; • Inverness Retail and Business Park; • Inverness College UHI; and • Farm land. 	High	Option 1A, 1B, 3A, 3B	Moderate	Moderate	Refer to mitigation recommended for SWF 01.
				Option 2A, 2B	Major	Large	

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
due to in channel working and potential loss of flood plain area during works.							
All options: Temporary increase in fine sediment as a result of construction of carriageway, culvert and outfall. Options 2A and 2B: Temporary increase in fine sediment as a result of part channel realignment. Diversion/damming of flow during in-channel works to construct realignment.	Fluvial geomorphology	Small channel with predominantly straight planform. Uniform cross-section with some variability in flow types. Some woody material present. Channel is embanked on both banks and appears to be overdeep for the majority of its course.	Low	All options	Moderate	Slight	Refer to mitigation recommended for SWF 02
Change in water quality due to potential siltation, pollution runoff, spillages, erosion and sedimentation as a result of: All options: construction of carriageway, culvert and outfall. Options 2A and 2B: additional part channel realignment.	Water quality/supply	Not classified under WFD. 'Good' water quality assumed. Surrounding land-use: urban, residential and agriculture. No licensed water abstractions identified in SEPA data.	High	All options	Major	Large	Refer to mitigation recommended for SWF 02.
	Dilution and removal of waste products	CAR licence for a discharge from Beechwood UHI campus. Potential additional pollutant sources: road and railway drainage and diffuse urban/rural sources.	High	All options	Major	Large	Refer to mitigation recommended for SWF 02.
	Biodiversity	Not classified under WFD. 'Moderate status' ecological quality equivalent assumed.	Medium	All options	Major	Large	Refer to mitigation recommended for SWF 02.
SWF 04: Scretan Burn							
All options: Construction of carriageway near SWF: Potential for temporary increase in hardstanding areas and soil compaction during construction works to result in temporary increased runoff rates in to the	Hydrology and Flood Risk	Drains a relatively small catchment. Receives water from at least five direct tributaries. Receptors: <ul style="list-style-type: none"> 50-100 (approx.) residential 	Very High	All options	Major	Very Large	Refer to mitigation recommended for SWF 01.

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
<p>water feature.</p> <p>Construction of two culverts. Temporary construction structures placed within flood risk zone or for flow diversion of the water feature may temporarily increase flood risk locally and be susceptible to flood damage.</p> <p>Construction of an outfall into the SWF. Temporary construction works for SUDS system within catchment may slightly increase peak flow rates into watercourse.</p>		<p>properties;</p> <ul style="list-style-type: none"> • Inverness Retail and Business Park; • A96 Aberdeen – Inverness Trunk Road; • Local road network; • Highland Main Line; and • Farm land. <p>The Stratton Development is proposed to be located in the lower reaches of this watercourse, in the vicinity of the A96 Aberdeen – Inverness Trunk Road.</p>					
All options: Temporary increase in fine sediment as a result of construction of carriageway, two culverts and an outfall.	Fluvial geomorphology	<p>WFD hydromorphology parameter status: not classified.</p> <p>Channel choked with vegetation and extensively realigned. Bed substrate consisting of fine/coarse gravels, some variability in flow types.</p> <p>Areas of erosion and deposition creating a varied bank structure.</p>	Medium	All options	Moderate	Moderate	Refer to mitigation recommended for SWF 02
<p>Change in water quality due to potential siltation, pollution runoff, spillages, erosion and sedimentation as a result of:</p> <p>All options: construction of carriageway, two culverts and an outfall.</p>	Water quality/supply	<p>WFD water quality status: Good.</p> <p>Surrounding land-use: urban, residential, agriculture and forestry.</p> <p>No licensed water abstractions identified in SEPA data.</p>	High	All options	Major	Large	Refer to mitigation recommended for SWF 02.
	Dilution and removal of waste products	<p>Three CAR licences identified: emergency overflow; septic tank effluent; and sewage treatment works final effluent.</p> <p>Potential additional pollutant sources:</p>	High	All options	Major	Large	Refer to mitigation recommended for SWF 02.

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
		road and railway drainage and diffuse urban/rural sources.					
	Biodiversity	WFD overall ecological status (Cairnlaw Burn): Moderate Fisheries status: not designated.	Medium	All options	Major	Large	Refer to mitigation recommended for SWF 02.
SWF 05: Tributary of Scretan Burn (2)							
All options: Construction of carriageway near SWF: Potential for temporary increase in hardstanding areas and soil compaction during construction works to result in temporary increased runoff rates in to the water feature. Construction of a culvert. Temporary construction structures placed within flood risk zone or for flow diversion of the water feature may temporarily increase flood risk locally and be susceptible to flood damage. Construction of stretches of channel realignment. Potential temporary increase in flood risk locally due to constrictions in flow due to in channel working and potential loss of flood plain area during works.	Hydrology and Flood Risk	Drains a small catchment. Receptors: <ul style="list-style-type: none"> • Approximately 7 residential properties; • Local road network; • Highland Main Line and • Farm land. 	High	All options	Major	Large	Refer to mitigation recommended for SWF 01.
All options: Temporary increase in fine sediment as a result of construction of carriageway, culvert and part channel realignment. Diversion/damming of flow during in-channel works to construct realignment.	Fluvial geomorphology	Small drainage channel with straight planform and trapezoidal cross-section. Channel is embanked on both banks.	Low	All options	Moderate	Slight	Refer to mitigation recommended for SWF 02
Change in water quality due to potential siltation, pollution runoff, spillages, erosion	Water quality/supply	Not classified under WFD. 'Good' water quality assumed.	High	All options	Major	Large	Refer to mitigation recommended for SWF 02.

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
and sedimentation as a result of construction of carriageway and culvert, and part channel realignment.		Surrounding land-use: residential and agriculture. No licensed water abstractions identified in SEPA data.					
	Dilution and removal of waste products	No licensed discharges identified in SEPA data. Potential additional pollutant sources: railway drainage.	Low	All options	Major	Moderate	Refer to mitigation recommended for SWF 02.
	Biodiversity	WFD overall ecological status: not classified. 'Moderate' equivalent assumed. Fisheries status: not designated.	Medium	All options	Major	Large	Refer to mitigation recommended for SWF 02.
SWF 06: Indirect tributary of Scretan Burn							
All options: Construction of carriageway near SWF: Potential for temporary increase in hardstanding areas and soil compaction during construction works to result in temporary increased runoff rates in to the water feature. Options 1B, 2B and 3B: Construction of part channel realignment. Potential temporary increase in flood risk locally due to constrictions in flow due to in channel working and potential loss of flood plain area during works.	Hydrology and Flood Risk	Drains a very small catchment. Receptors: <ul style="list-style-type: none"> Farm land. 	Low	Options 1A, 2A, 3A	Minor	Neutral	Refer to mitigation recommended for SWF 01.
				Option 1B, 2B, 3B	Moderate	Slight	
All options: Temporary increase in fine sediment as a result of construction of carriageway. Options 1B, 2B and 3B: Temporary increase in fine sediment as a result of part channel realignment. Diversion/damming of	Fluvial geomorphology	Small field drain with a straight planform and silt substrate. Channel is dominated by terrestrial grass in several sections.	Low	Options 1A, 2A and 3A	Moderate	Slight	Refer to mitigation recommended for SWF 02

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
flow during in-channel works to construct realignment.							
Change in water quality due to potential siltation, pollution runoff, spillages, erosion and sedimentation as a result of: All options: construction of carriageway. Options 1B, 2B and 3B: part channel realignment.	Water quality/supply	Not classified under WFD. 'Good' water quality assumed. Surrounding land-use: agriculture. No licensed water abstractions identified in SEPA data.	High	Options 1A, 2A and 3A	Moderate	Moderate	Refer to mitigation recommended for SWF 02. However, no requirement to apply for CAR licences under requirements of the CAR Regulations.
				Options 1B, 2B and 3B	Major	Large	Refer to mitigation recommended for SWF 02.
	Dilution and removal of waste products	No licensed discharge consents identified in SEPA data.	Low	Options 1A, 2A and 3A	Moderate	Slight	Refer to mitigation recommended for SWF 02. However, no requirement to apply for CAR licences under requirements of the CAR Regulations.
				Options 1B, 2B and 3B	Major	Moderate	Refer to mitigation recommended for SWF 02.
	Biodiversity	WFD overall ecological status: not classified. 'Moderate' equivalent assumed. Fisheries status: not designated.	Medium	Options 1A, 2A and 3A	Moderate	Moderate	Refer to mitigation recommended for SWF 02. However, no requirement to apply for CAR licences under requirements of the CAR Regulations.
				Options 1B, 2B and 3B	Major	Large	Refer to mitigation recommended for SWF 02.
SWF 07: Un-named drain							
Options 1A, 2A and 3A: Construction of carriageway near SWF: Potential for temporary increase in	Hydrology and Flood Risk	Drains a very small catchment. On the edge of PVA 01/20.	High	Options 1A, 2A, 3A	Major	Large	Refer to mitigation recommended for SWF 01.

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
<p>hardstanding areas and soil compaction during construction works to result in temporary increased runoff rates in to the water feature.</p> <p>Construction of a culvert. Temporary construction structures placed within flood risk zone or for flow diversion of the water feature may temporarily increase flood risk locally and be susceptible to flood damage.</p> <p>Construction of an outfall into the SWF. Temporary construction works for SUDS system within catchment may slightly increase peak flow rates into watercourse.</p>		<p>Receptors:</p> <ul style="list-style-type: none"> • Farm land; and • Local road. <p>The Stratton Development is proposed to be located in the SWF 07 catchment in the vicinity of the A96 Aberdeen – Inverness Trunk Road and the route options.</p>		Option 1B, 2B, 3B	Negligible	Neutral	
Options 1A, 2A and 3A: Temporary increase in fine sediment as a result of construction of carriageway, culvert and outfall. Diversion/damming of flow during in-channel works to construct culvert and outfall.	Fluvial geomorphology	Consists of one road drain and a small field drain. Channel planform was straight and overgrown with brambles.	Low	Options 1A, 2A and 3A	Moderate	Slight	Refer to mitigation recommended for SWF 02
<p>Change in water quality due to potential siltation, pollution runoff, spillages, erosion and sedimentation as a result of:</p> <p>Options 1A, 2A and 3A: construction of carriageway, culvert and outfall.</p>	Water quality/supply	<p>Not classified under WFD. 'Good' water quality assumed.</p> <p>Surrounding land-use: agriculture.</p> <p>No licensed water abstractions identified in SEPA data.</p>	High	Options 1A, 2A and 3A	Major	Large	Refer to mitigation recommended for SWF 02.
	Dilution and removal of waste products	No licensed discharge consents identified in SEPA data.	Low	Options 1A, 2A and 3A	Major	Moderate	Refer to mitigation recommended for SWF 02.
	Biodiversity	<p>WFD overall ecological status: not classified. 'Moderate' equivalent assumed.</p> <p>Fisheries status: not designated.</p>	Medium	Options 1A, 2A and 3A	Major	Large	Refer to mitigation recommended for SWF 02.

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
SWF 08: Cairnlaw Burn							
<p>All options: Construction of carriageway near SWF: Potential for temporary increase in hardstanding areas and soil compaction during construction works to result in temporary increased runoff rates in to the water feature.</p> <p>Construction of one (1A, 2A, 3A) or two (1B, 2B, 3B) culverts. Temporary construction structures placed within flood risk zone or for flow diversion of the water feature may temporarily increase flood risk locally and be susceptible to flood damage.</p> <p>Construction of one (1A, 2A, 3A) / two (1B, 2B, 3B) outfall(s) into the SWF. Temporary construction works for SUDS system within catchment may slightly increase peak flow rates into watercourse.</p> <p>Construction of channel realignments. Potential temporary increase in flood risk locally due to constrictions in flow due to in channel working and potential loss of flood plain area during works.</p> <p>Construction of swales. Potential for temporary increase in flood risk during construction due to increased runoff rates into the watercourse due to increased soil compaction and hardstanding.</p>	Hydrology and Flood Risk	<p>Drains a medium catchment. Receives water from at least four direct tributaries. Within PVA 01/20.</p> <p>Receptors:</p> <ul style="list-style-type: none"> • 50-100 (approx.) residential properties; • School; • A96 Aberdeen – Inverness Trunk Road; • Local road network; • Highland Main Line; • Aberdeen to Inverness Railway Line; and • Farm and farm land. <p>The Stratton Development is proposed to be located in the lower reaches of this watercourse, in the vicinity of the A96 Aberdeen – Inverness Trunk Road and the route options.</p> <p>Potential upstream impacts in Culloden.</p>	Very High	All options	Major	Very Large	Refer to mitigation recommended for SWF 01.
All options: Temporary increase in fine sediment as a result of construction of carriageway, culvert(s) and outfall(s), and	Fluvial geomorphology	WFD 'Physical Condition' parameter status: Moderate. Predominantly cobble bed with	Medium	All options	Moderate	Moderate	Refer to mitigation recommended for SWF 02

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
part channel realignment.		depositional features. Diversity of flow types. Predominantly straight planform.					
Change in water quality due to potential siltation, pollution runoff, spillages, erosion and sedimentation as a result of construction of carriageway, culvert(s) and outfall(s), and part channel realignment.	Water quality/supply	WFD water quality status: Good. Surrounding land-use: urban, residential and agriculture. No licensed water abstractions identified in SEPA data.	High	All options	Major	Large	Refer to mitigation recommended for SWF 02.
	Dilution and removal of waste products	No licensed discharge consents identified in SEPA data. Potential additional pollutant sources: road and railway drainage and diffuse urban/rural sources.	Medium	All options	Major	Large	Refer to mitigation recommended for SWF 02.
	Biodiversity	WFD overall ecological status (Cairnlaw Burn): Moderate Fisheries status: not designated.	Medium	All options	Major	Large	Refer to mitigation recommended for SWF 02.
SWF 09: Indirect tributary of Cairnlaw Burn							
All options: Potential upstream propagation of water into the SWF 09 catchment as the Scheme impacts SWF 08 a watercourse located approximately 260m downstream of SWF 09 confluence with SWF 10.	Hydrology and Flood Risk	Drains a very small catchment. Receives water from at least one direct tributary. Within PVA 01/20. Receptors: <ul style="list-style-type: none"> • 1-10 (approx.) residential properties (in upper reaches); • Farm land; and • Highland Main Line. This watercourse is just outside the boundary of the proposed Stratton Development.	Medium	All options	Negligible	Neutral	Refer to mitigation recommended for SWF 01.
SWF 10: Tributary of Cairnlaw Burn (1)							

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
All options: Construction of carriageway near SWF. Potential upstream propagation of water into the SWF 10 catchment as the route options impact SWF 08 in the vicinity of / downstream of the SWF 10/SWF 08 confluence.	Hydrology and Flood Risk	Drains a relatively small catchment. Receives water from at least four direct tributaries. Within PVA 01/20. Receptors: <ul style="list-style-type: none"> • Approx. 50 residential properties; • Local road network; • Farm land; and • Highland Main Line. The proposed Stratton Development is located within the lower reaches of the SWF 10 catchment.	High	All options	Minor	Slight	Refer to mitigation recommended for SWF 01.
All options: Temporary increase in fine sediment as a result of construction of carriageway.	Fluvial geomorphology	WFD hydromorphology parameter status: not classified. Cobble substrate and depositional features including side bars. Rippled flow and vegetated riparian buffer.	Medium	All options	Minor	Slight	Implement appropriate control measures for site runoff and sedimentation. Follow SEPA approved construction methods and limit the extent of disturbance.
Change in water quality due to potential siltation, pollution runoff, spillages, erosion and sedimentation as a result of construction of carriageway.	Water quality/supply	Not classified under WFD. 'Good' water quality assumed. Surrounding land-use: residential, agriculture and forestry. No licensed water abstractions identified in SEPA data.	High	All options	Moderate	Moderate	Refer to mitigation recommended for SWF 02. However, no requirement to apply for CAR licences under requirements of the CAR Regulations.
	Dilution and removal of waste products	No licensed discharge consents identified in SEPA data. Potential additional pollutant sources: road and railway drainage and diffuse urban/rural sources.	Medium	All options	Moderate	Moderate	
	Biodiversity	WFD overall ecological status: not	High	All	Moderate	Moderate	

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
		classified. 'Good' equivalent assumed. Fisheries status: not designated.		options			
SWF 11: Tributary of Cairnlaw Burn (2)							
All options: no potential impacts identified for this surface water feature.	Hydrology and Flood Risk	Drains a very small catchment. Does not receive flow from any tributaries. Within PVA 01/20. Receptors: <ul style="list-style-type: none"> • Grounds of former hotel; • Farm land; and • Woodland. SWF 11 is on the boundary of the Stratton Development.	High	All options	Negligible	Neutral	Not required.
SWF 12: Kenneth's Black Well							
All options: no potential impacts identified for this surface water feature.	Hydrology and Flood Risk	Drains a relatively small catchment. Receives water from at least three direct tributaries. Within PVA 01/20. The Smithton and Culloden Flood Alleviation Scheme is proposed within the upper reaches of this catchment. Receptors: <ul style="list-style-type: none"> • Residential properties (approx. 50); • Local road network; • Grounds of a school; • Farm land; and • Highland Main Line. 	High	All options	Negligible	Neutral	Not required
Groundwater							
Change in groundwater quality due to	Water	Protected by Drinking Water	High	All	Major	Large	Refer to mitigation recommended for

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
construction of carriageway.	quality/supply	Protection Area. Various abstractions identified within the study area from SEPA data.		options			SWF 02.
	Soakaway	Various discharges to groundwater.	High	All options	Major	Large	
	Vulnerability	Aquifer classified as having minor or moderate permeability. WFD overall groundwater status classified as 'Good'.	High	All options	Major	Large	

Table 2: Summary of Impacts on SWFs during Operation and Potential Mitigation

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
SWF 01: Mill Burn							
All options: no potential impacts identified for this surface water feature.	Hydrology and Flood Risk	Drains a relatively small sized catchment. Receives water from at least two direct tributaries. The watercourse is within PVA 01/21. Receptors: <ul style="list-style-type: none"> >100 residential properties; Commercial areas; Local road network; Farm land; and Golf course. 	Very High	All options	Negligible	Neutral	None required.
SWF 02: Inshes Burn							
Options 1A, 1B, 2A, 2B: Potential alterations to flood risk due to: construction of a new culvert and realignment of the watercourse. Possible loss of flood storage due to road construction. All options: Increased impervious surfaces due to carriageway near SWF. Potential impact to flood risk due to alteration to area draining to the catchment due to road drainage and due to one road drainage outfall discharging to SWF 02. Possible loss of flood storage due to road construction.	Hydrology and Flood Risk	Drains a small catchment. Receives water from at least three direct tributaries. Receptors: <ul style="list-style-type: none"> Approx 100 residential properties including some near Inshes Retail Park identified as particularly flood-sensitive by consultation responses; Raigmore Hospital; A9; Inverness Retail and Business Park; Local road network; and Farm land. 	Very High	Options 1A, 1B, 2A, 2B	Moderate	Large	SUDS system designed to limit road drainage outflow to the greenfield pre-development runoff rate of a 50%AEP (1 in 2 year return period) flood event. Appropriate culvert sizing and flood mitigation as identified in detailed design
				Options 3A, 3B	Minor	Moderate	
All options: Increase in runoff and fine	Fluvial	Straightened channel choked with	Low	Option	Minor	Neutral	Adhere to guidance set by SEPA

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
sediment as a result of new carriageway Options 1A, 1B, 2A and 2B: Potential for alterations to flow and sediment regime due to culvert, outfall and part channel realignment. Changed channel morphology due to increase of artificial bed and bank material associated with structures and channel realignment.	geomorphology	vegetation, extensively realigned with a trapezoidal cross section and reinforced banks. The channel was culverted under several roads.		3B			on culverting of watercourses, bank protection, intakes and outfalls and river crossings (SEPA, 2006; SEPA, 2012; SEPA, 2008; SEPA, 2010). Consult with a geomorphologist at design phase to incorporate the following: Minimise the length of realignment, culvert and number of in-channel structures. Ensure in-channel structures are positioned correctly to minimise scour and alterations to natural flow. Maintain gradient and length of water feature to prevent siltation through culvert/realigned channel or scour around in-channel structures. Where possible, maintain sinuosity of channel and create natural bed and identify other possible improvements to water feature morphology and habitats.
				Option 1A, 1B, 2A and 2B	Moderate	Slight	
All options: Change in water quality due to operation of single outfall.	Water quality/supply	Not classified under WFD. 'Good' water quality assumed. Surrounding land-use: urban, residential and agriculture; forestry upstream. No licensed water abstractions identified in SEPA data.	High	Options 1A, 1B, 2A and 2B	Moderate	Large	Provide suitable form of treatment for routine runoff prior to outfall. Ensure outfall and method of treatment are appropriately maintained.
				Options 3A and 3B	Minor	Slight	

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
	Dilution and removal of waste products	CAR licence for combined sewer overflow from residential property. Potential additional pollutant sources: road and railway drainage and diffuse urban/rural sources.	High	Options 1A, 1B, 2A and 2B	Moderate	Large	
				Options 3A and 3B	Negligible	Neutral	
	Biodiversity	WFD overall ecological status: not classified. 'Moderate' equivalent assumed. Fisheries status: not designated.	Medium	Options 1A, 1B, 2A and 2B	Moderate	Moderate	
				Options 3A and 3B	Minor	Slight	
SWF 03: Tributary of Scretan Burn (1)							
All options: Potential alterations to flood risk due to construction of a new culvert. Potential impact to flood risk due to alteration to area draining to the catchment due to road drainage and due to one road drainage outfall discharging to SWF 03. Possible loss of flood storage due to road construction. Increased impervious surfaces due to carriageway near SWF. Options 2A and 2B: Potential alterations to flood risk due to channel realignment.	Hydrology and Flood Risk	Drains a small catchment. Receptors: <ul style="list-style-type: none"> • More than 10 residential properties, including some at Inshes Smallholdings identified as particularly flood-sensitive by consultation responses; • A9; • Local road network; • Highland Main Line; • Inverness Retail and Business Park; • Inverness College (University of the Highlands and Islands); and • Farm land. 	High	All options	Moderate	Moderate	SUDS system designed to limit road drainage outflow to the greenfield pre-development runoff rate of a 50%AEP (1 in 2 year return period) flood event. Appropriate culvert sizing and flood mitigation as identified in detailed design
All options: Increase in runoff and fine	Fluvial	Small channel with predominantly straight	Low	All	Moderate	Slight	Refer to mitigation

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
sediment as a result of new carriageway Potential for alterations to flow and sediment regime due to culvert and outfall. Changed channel morphology due to increase of artificial bed and bank material associated with structures. Options 2A and 2B: Potential for alterations to flow and sediment regime due to realignment. Changed channel morphology due to realignment.	geomorphology	planform. Uniform cross-section with some variability in flow types. Some woody material present. Channel is embanked on both banks and appears to be overdeep for the majority of its course.		options			recommended for SWF 02.
All options: Change in water quality due to operation of single outfall.	Water quality/supply	Not classified under WFD. 'Good' water quality assumed. Surrounding land-use: urban, residential and agriculture. No licensed water abstractions identified in SEPA data.	High	All options	Minor	Moderate	Refer to mitigation recommended for SWF 02.
	Dilution and removal of waste products	CAR licence for a discharge from Inverness College UHI campus. Potential additional pollutant sources: road and railway drainage and diffuse urban/rural sources.	High	All options	Minor	Moderate	
	Biodiversity	Not classified under WFD. 'Moderate status' ecological quality equivalent assumed.	Medium	All options	Minor	Slight	
SWF 04: Scretan Burn							
All options: Potential alterations to flood risk due to construction of two new culverts. Potential impact to flood risk due to alteration to area draining to the catchment	Hydrology and Flood Risk	Drains a relatively small catchment. Receives water from at least five direct tributaries. Receptors: <ul style="list-style-type: none"> 50-100 (approx.) residential 	Very High	All options	Moderate	Large	SUDS system designed to limit road drainage outflow to the greenfield pre-development runoff rate of a 50%AEP (1 in 2 year return period) flood event. Appropriate culvert sizing and

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
<p>due to road drainage and due to one road drainage outfall discharging to SWF 04.</p> <p>Loss of flood storage due to road construction. Road constructed across some areas identified by SEPA flood maps as being within the 0.5% AEP (1 in 200 year event) flood extent outline.</p> <p>Increased impervious surfaces due to carriageway near SWF.</p>		<p>properties;</p> <ul style="list-style-type: none"> • Inverness Retail and Business Park; • A96 Aberdeen – Inverness Trunk Road; • Local road network; • Highland Main Line; and • Farm land. <p>The Stratton Development is proposed to be located in the lower reaches of this watercourse, in the vicinity of the A96 Aberdeen – Inverness Trunk Road.</p>					flood mitigation as identified in detailed design
<p>All options: Increase in runoff and fine sediment as a result of new carriageway</p> <p>Potential for alterations to flow and sediment regime due to two culverts and outfall. Changed channel morphology due to increase of artificial bed and bank material associated with structures.</p>	Fluvial geomorphology	<p>WFD hydromorphology parameter status: not classified.</p> <p>Channel choked with vegetation and extensively realigned. Bed substrate consisting of fine/coarse gravels, some variability in flow types.</p> <p>Areas of erosion and deposition creating a varied bank structure.</p>	Medium	All options	Moderate	Moderate	Refer to mitigation recommended for SWF 02.
<p>All options: Change in water quality due to operation of single outfall.</p>	Water quality/supply	<p>WFD water quality status: Good.</p> <p>Surrounding land-use: urban, residential, agriculture and forestry.</p> <p>No licensed water abstractions identified in SEPA data.</p>	High	All options	Negligible	Neutral	Refer to mitigation recommended for SWF 02.
	Dilution and removal of waste products	<p>Three CAR licences identified: emergency overflow; septic tank effluent; and sewage treatment works final effluent.</p> <p>Potential additional pollutant sources: road and railway drainage and diffuse</p>	High	All options	Negligible	Neutral	

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
		urban/rural sources.					
	Biodiversity	WFD overall ecological status (Cairnlaw Burn): Moderate Fisheries status: not designated.	Medium	All options	Negligible	Neutral	
SWF 05: Tributary of Scretan Burn (2)							
All options: Potential alterations to flood risk due to construction of a new culvert and stretches of channel realignment. Increased impervious surfaces due to carriageway near SWF. Potential impact to flow due to possible alteration to area draining to the watercourse due to road. Possible loss of flood storage due to road construction. Options 1B, 2B and 3B: Road constructed across some areas identified by SEPA flood maps as being within the 0.5% AEP (1 in 200 year event) flood extent outline.	Hydrology and Flood Risk	Drains a small catchment. Receptors: <ul style="list-style-type: none"> Approximately 7 residential properties; Local road network; Highland Main Line; and Farm land. 	High	All options	Moderate	Large	Appropriate culvert sizing and flood mitigation as identified in detailed design
All options: Increase in runoff and fine sediment as a result of new carriageway Potential for alterations to flow and sediment regime due to culvert and realignment. Changed channel morphology due to increase of artificial bed and bank material associated with structures and realignment.	Fluvial geomorphology	Small drainage channel with straight planform and trapezoidal cross-section. Channel is embanked on both banks.	Low	All options	Moderate	Slight	Adhere to guidance set by SEPA on culverting of watercourses, bank protection and river crossings (SEPA, 2006; SEPA, 2012; SEPA, 2010). Consult with a geomorphologist at design phase to incorporate the following: Minimise the length of realignment and culvert.

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
							<p>Ensure in-channel structures are positioned correctly to minimise scour and alterations to natural flow.</p> <p>Maintain gradient and length of water feature to prevent siltation through culvert/realigned channel or scour around in-channel structures.</p> <p>Where possible, maintain sinuosity of channel and create natural bed and identify other possible improvements to water feature morphology and habitats.</p>
SWF 06: Indirect tributary of Scretan Burn							
<p>All options: Increased impervious surfaces due to carriageway near SWF.</p> <p>Options 1B, 2B and 3B: Potential Increase in flood risk due to channel realignment.</p> <p>Possible loss of flood plain storage due to road construction.</p> <p>Potential impact to area draining to the catchment due to road crossing the catchment.</p>	Hydrology and Flood Risk	<p>Drains a very small catchment.</p> <p>Receptors:</p> <ul style="list-style-type: none"> Farm land. 	Low	Options 1A, 2A, 3A	Negligible	Neutral	Appropriate culvert sizing and flood mitigation as identified in detailed design
				Options 1B, 2B, 3B	Moderate	Slight	
<p>All options: Increase in runoff and fine sediment as a result of new carriageway</p> <p>Options 1B, 2B and 3B: Potential for alterations to flow and sediment regime due to realignment. Changed channel morphology due to realignment.</p>	Fluvial geomorphology	Small field drain with a straight planform and silt substrate. Channel is dominated by terrestrial grass in several sections.	Low	All options	Minor	Neutral	Incorporate appropriate sediment retention methods and SUDS such as attenuation ponds, swales or soakaways to reduce delivery of fine sediment and peak flows.

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
							<p>Consult with a geomorphologist at design phase to incorporate the following:</p> <p>Minimise the length of realignment.</p> <p>Maintain gradient and length of water feature to prevent siltation through realigned channel.</p> <p>Where possible, maintain sinuosity of channel and create natural bed and identify other possible improvements to water feature morphology and habitats.</p>
SWF 07: Un-named drain							
<p>Options 1A, 2A and 3A: Increased impervious surfaces due to carriageway near SWF. Potential alterations to flood risk due to construction of a new culvert. Potential catchment severance as the road cuts across the catchment. Possible loss of flood plain storage due to road construction. Potential impact to flood risk due to alteration to area draining to the catchment due to road drainage and due to one road drainage outfall discharging to SWF 07.</p>	Hydrology and Flood Risk	<p>Drains a very small catchment. On the edge of PVA 01/20. Receptors:</p> <ul style="list-style-type: none"> • Farm land; and • Local road. <p>The Stratton Development is proposed to be located in the SWF 07 catchment in the vicinity of the A96 Aberdeen – Inverness Trunk Road and the route options.</p>	High	Options 1A, 2A, 3A	Moderate	Moderate	<p>SUDS system designed to limit road drainage outflow to the greenfield pre-development runoff rate of a 50%AEP (1 in 2 year return period) flood event. Appropriate culvert sizing and flood mitigation as identified in detailed design.</p>
				Options 1B, 2B, 3B	Negligible	Neutral	
Options 1A, 2A and 3A: Increase in runoff and fine sediment as a result of new carriageway. Potential for alterations to flow and sediment regime due to culvert	Fluvial geomorphology	Consists of one road drain and a small field drain. Channel planform was straight and overgrown with brambles.	Low	1A, 2A and 3A	Moderate	Slight	Adhere to guidance set by SEPA on culverting of watercourses, bank protection, intakes and outfalls and river crossings

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
and outfall. Changed channel morphology due to increase of artificial bed and bank material associated with structures.							(SEPA, 2006; SEPA, 2012; SEPA, 2008; SEPA, 2010). Consult with a geomorphologist at design phase to incorporate the following: Minimise the length of culvert and number of in-channel structures. Ensure in-channel structures are positioned correctly to minimise scour and alterations to natural flow. Maintain gradient and length of water feature to prevent siltation through culvert or scour around in-channel structures.
Options 1A, 2A and 3A: Change in water quality due to operation of single outfall.	Water quality/supply	Not classified under WFD. 'Good' water quality assumed. Surrounding land-use: agriculture. No licensed water abstractions identified in SEPA data.	High	Options 1A, 2A and 3A	Major	Large	Refer to mitigation recommended for SWF 02.
	Dilution and removal of waste products	No licensed discharge consents identified in SEPA data.	Low	Options 1A, 2A and 3A	Major	Moderate	
	Biodiversity	WFD overall ecological status: not classified. 'Moderate' equivalent assumed. Fisheries status: not designated.	Medium	Options 1A, 2A and 3A	Major	Large	
SWF 08: Cairnlaw Burn							
All options:	Hydrology and	Drains a medium catchment.	Very High	Options	Moderate	Large	SUDS system designed to limit

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
<p>Increased impervious surfaces due to carriageway near SWF.</p> <p>Potential alterations to flood risk due to construction of one (1A, 2A, 3A) or two (1B, 2B, 3B) culverts.</p> <p>Potential impact to flood risk due to alteration to area draining to the catchment due to road drainage and due to one (1A, 2A, 3A) / two (1B, 2B, 3B) road drainage outfall(s) discharging to SWF 08.</p> <p>Potential alterations to flood risk due to swales in close proximity to the watercourse.</p> <p>Loss of flood storage due to road construction. Road constructed across some areas identified by SEPA flood maps as being within the 0.5% AEP (1 in 200 year event) flood extent outline.</p> <p>Potential Increase in flood risk due to channel realignment. Extensive realignments proposed for options 1A, 2A, and 3A.</p>	Flood Risk	<p>Receives water from at least four direct tributaries.</p> <p>Within PVA 01/20.</p> <p>Receptors:</p> <ul style="list-style-type: none"> • 50-100 (approx.) residential properties; • School; • A96 Aberdeen – Inverness Trunk Road; • Local road network; • Highland Main; • Aberdeen to Inverness Railway Line; and • Farm and farm land. <p>The Stratton Development is proposed to be located in the lower reaches of this watercourse, in the vicinity of the A96 Aberdeen – Inverness Trunk Road and the route options.</p> <p>Potential upstream impacts in Culloden.</p>		<p>1A, 2A, 3A</p> <p>Options 1B, 2B, 3B</p>	Moderate	Large	<p>road drainage outflow to the greenfield pre-development runoff rate of a 50%AEP (1 in 2 year return period) flood event.</p> <p>Flood storage mitigation requirements and provisions TBC.</p>
<p>All options: Increase in runoff and fine sediment as a result of new carriageway.</p> <p>Potential for alterations to flow and sediment regime due to culvert(s), outfall(s) and realignments. Changed channel morphology due to increase of artificial bed and bank material associated with structures and realignment.</p>	Fluvial geomorphology	<p>WFD 'Physical Condition' parameter status: Moderate.</p> <p>Predominantly cobble bed with depositional features. Diversity of flow types. Predominantly straight planform.</p>	Medium	All options	Moderate	Moderate	Refer to mitigation recommended for SWF 02.
<p>All options: Change in water quality due to</p>	Water	WFD water quality status: Good.	High	Options 1A, 2A	Minor	Slight	Refer to mitigation

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
operation of outfall(s).	quality/supply	Surrounding land-use: urban, residential and agriculture. No licensed water abstractions identified in SEPA data.		and 3A			recommended for SWF 02.
				Options 1B, 2B and 3B	Moderate	Large	
	Dilution and removal of waste products	No licensed discharge consents identified in SEPA data. Potential additional pollutant sources: road and railway drainage and diffuse urban/rural sources.	Medium	Options 1A, 2A and 3A	Negligible	Neutral	
				Options 1B, 2B and 3B	Moderate	Moderate	
	Biodiversity	WFD overall ecological status (Cairnlaw Burn): Moderate Fisheries status: not designated.	Medium	Options 1A, 2A and 3A	Minor	Slight	
				Options 1B, 2B and 3B	Moderate	Moderate	
SWF 09: Indirect tributary of Cairnlaw Burn							
All options: Potential upstream propagation of water into the SWF 09 catchment as the route options impact SWF 08 a watercourse located approximately 260m downstream of SWF 09 confluence with SWF 10.	Hydrology and Flood Risk	Drains a very small catchment. Receives water from at least one direct tributary. Within PVA 01/20. Receptors: <ul style="list-style-type: none"> • 1-10 (approx.) residential properties (in upper reaches); • Farm land; and • Highland Main Line. This watercourse is just outside the boundary of the proposed Stratton Development.	Medium	All options	Minor	Slight	Measures to mitigate any upstream propagation of water from the SWF 08 catchment need to be assessed and if relevant appropriate mitigation measures investigated.

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
SWF 10: Tributary of Cairnlaw Burn (1)							
All options: Increased impervious surfaces due to carriageway near SWF. Potential upstream propagation of water into the SWF 10 catchment as the route options impact SWF 08 in the vicinity of / downstream of the SWF 10/SWF 08 confluence.	Hydrology and Flood Risk	Drains a relatively small catchment. Receives water from at least four direct tributaries. Within PVA 01/20. Receptors: <ul style="list-style-type: none"> • Approx. 50 residential properties; • Local road network; • Farm land; and • Highland Main Line. The proposed Stratton Development is located within the lower reaches of the SWF 10 catchment.	High	All options	Minor	Slight	Measures to mitigate any upstream propagation of water from the SWF 08 catchment need to be assessed and if relevant appropriate mitigation measures investigated.
All options: Increase in runoff and fine sediment as a result of new carriageway.	Fluvial geomorphology	WFD hydromorphology parameter status: not classified. Cobble substrate and depositional features including side bars. Rippled flow and vegetated riparian buffer.	Medium	All options	Minor	Slight	Incorporate appropriate sediment retention methods and SUDS such as attenuation ponds, swales or soakaways to reduce delivery of fine sediment and peak flows.
SWF 11: Tributary of Cairnlaw Burn (2)							
All options: no potential impacts identified for this surface water feature.	Hydrology and Flood Risk	Drains a very small catchment. Does not receive flow from any tributaries. Within PVA 01/20. Receptors: <ul style="list-style-type: none"> • Grounds of former hotel; • Farm land; and • Woodland. The proposed Stratton Development is	High	All options	Negligible	Neutral	None required.

Description of Potential Impact	Attribute	Indicator of Quality	Sensitivity	Route Option	Magnitude	Significance	Potential Mitigation
		located within the SWF 11 catchment.					
SWF 12: Kenneth's Black Well							
All options: no potential impacts identified for this surface water feature.	Hydrology and Flood Risk	<p>Drains a relatively small catchment. Receives water from at least three direct tributaries. Within PVA 01/20. The Smithton and Culloden Flood Alleviation Scheme is proposed within the upper reaches of this catchment.</p> <p>Receptors:</p> <ul style="list-style-type: none"> • Residential properties (approx. 50); • Local road network; • Grounds of a school; • Farm land; and • Highland Main Line. 	High	All options	Negligible	Neutral	None required.