Visual Receptor	Visual Sensitivity	Potential Operational Impacts without Mitigation	Likely Operational Impacts with Mitigation	Residual Significant Effects
Night hikers and observers of the night skies	High	Medium	Medium	Significant (Major-moderate – adverse)

Summary

7.10.29 There would be no significant residual effects on night landscape character.

7.10.30 As mitigation planting becomes established, the lighting effects of the proposed new community would gradually diminish and the only significant residual effects on visual amenity would be from the elevated viewpoints at Craigellachie National Nature Reserve (Location 8) and from Craiggowrie Summit (Location 11). In both cases receptors would be a small number of night-hikers and observers of the night skies.

7.11 EFFECT ON HYDROLOGY & WATER QUALITY

Introduction

7.11.1 This chapter assesses the impact of the proposed housing development at An Camas Mòr on surface water, ground water and water quality. The chapter considers the impacts from the new development during the construction phase (finishing in 2027) and at any stage of the operational phase. The assessment also includes consideration of the impacts of new access roads and river crossings.

7.11.2 The assessment of the proposed development on flood risk is presented as a Supporting Document and the impact on ecology at the site would be considered in Volume 2 Chapter 9 Section 4.

Scope

7.11.3 The scope of this assessment considers the likely effect of the proposed new community on the water environment at a site level, local level and in relation to the Cairngorms National Park. In particular, the assessment covers the Spey and Druie Rivers as major receptors in this development. A range of hydrological information has been used to describe the baseline conditions. The proposed new community is assessed against these conditions, in relation to a series of different stages of development and over different time periods.

Possible Effects and Inter-relationships

7.11.4 Several possible effects and Inter-relationships have been identified as relevant to the assessment of the effect on Hydrology and Water Quality. Table 7.11 lists the various effects and Inter-relationships with the Environmental Impact Assessment topics. Possible Inter-relationships have been identified with Ecology and Nature Conservation and Geology and Soils.

Influence of Periods A-D on Assessment

7.11.5 The project is planned to be developed in three main stages:

- 2006-2011 – 100 residences in total;
- 2011-2016 – 400 residences in total;
- 2016-2018 – 600 residences in total; and
- 2018-2027 – 1500 residences in total.

7.11.6 Potential impacts are likely to be of most significance during the construction period. The significance of the potential impact would be closely dependent on the specific method used to carry out the construction works.

Consultations

7.11.7 Consultations were conducted with SEPA, Scottish Water and The Highland Council. For detailed explanation of consultation and response see Volume 2, Chapter 9, Section 9 - Consultations.

The Study Area

7.11.8 The proposed site is bounded by the River Spey, to the north and west, and the River Druie to the south-west. The confluence of the two rivers lies close to the south-west corner of the development site. The catchment area of the River Spey, upstream of the confluence is 1067km^2. The River Druie, which then joins the River Spey, has a much smaller catchment area of 119km^2. Downstream of the confluence is a SEPA gauging station (Boat of Garten, NH 946 191) where the mean flow is 29.03m^3/s.

7.11.9 The overall site for An Camas Mòr is 104.6 hectares, of which 72 hectares have been designated for the housing development. The land use of this area is currently commercial forestry and heathland, which allows infiltration to occur and slows the velocity of surface runoff. The remaining 30 hectares, which lie to the north, west and south of the site (adjacent to the River Spey and River Druie), comprise arable farmland.

7.11.10 The development site lies within the Cairngorms National Park boundary, near the foothills of the Cairngorms. The main watercourses within the vicinity of the

site are the River Spey and the River Druie. The Spey is a designated Special Area of Conservation (SAC) as well as a Site of Special Scientific Interest (SSSI). The Spey SAC designation covers the main watercourse and its tributaries as well as the confluence and stretch of the River Druie adjacent to the Proposed Development site.

7.11.11 The Spey is designated a SAC and SSSI for its populations of otter, Atlantic salmon (*Salmo salar*), sea lamprey (*Petromyzon marinus*), and freshwater pearl mussel (*Margaritifera margaritifera*). Whilst such species are sensitive to water quality, the River Spey Catchment Management Plan (Spey Catchment Steering Group, 2006) highlights that their water quality requirements are still poorly understood.

7.11.12 To assess the impact of the whole development, the development site itself, the major routes and all the land between the development boundary and the watercourses (River Spey and the River Druie) has been considered in this assessment.

Baseline Conditions

Surface Water Hydrology and Water Quality

7.11.13 The overall water quality of the River Spey has been classified by SEPA as "Good" (A2) and the overall water quality of the River Druie as "Excellent" (A1).

Groundwater Hydrology

7.11.14 The site of the proposed development is underlain by glacio-fluvial sands and gravels. Areas adjacent to the main watercourses, where the distributor roads have been planned, are underlain by freshwater alluvium (current river terrace).

7.11.15 The geology map identifies the solid geology as impermeable Pre-Cambrian Schists and Gneisses. The hydrogeology map also identifies the area as being underlain by impermeable rocks, generally without groundwater, except at shallow depth.

7.11.16 SEPA have identified two known water abstractions within the area held by the Rothiemurchus Estate. The site does not lie in a nitrate vulnerable zone, although the shallow nature of the groundwater does put it at risk from diffuse and point-source pollutions.

7.11.17 The site does not lie in a nitrate vulnerable zone, although the shallow nature of the groundwater does put it at risk from diffuse and point-source pollution.

Sewers and Drainage

7.11.18 Scottish Water (SW) has provided information regarding the existing infrastructure in and around the proposed site. There are no public sewers or

drains which run through the development. All existing surface drainage paths are on the periphery of the proposed development.

Designations

7.11.19 The proposed development site lies within the Cairngorms National Park. The main watercourses within the vicinity of the site are the River Spey and the River Druie. The River Spey is a designated Special Area of Conservation (SAC) as well as a Site of Special Scientific Interest (SSSI). The River Spey SAC designation includes the stretch of the River Druie adjacent to the proposed development site.

Key Considerations

7.11.20 The possible effects on hydrology and water quality, which form the key considerations for assessment are:

- Impact of construction and operation on surface water quantity and quality;
- Impact of construction and operation on groundwater; and
- Impacts resulting from construction of sewers and drainage.

7.11.21 The possible impacts on hydrology and water quality, which form the key considerations for assessment, are:

- Increase in surface run off from site, interception of existing drainage, and increased sedimentation during construction;
- Increased sedimentation, increased suspended solids in run-off, risk of chemical pollution and risk of leachate from construction site;
- Disruption of flow paths, change in water table, risk of release of pollutants into groundwater and risk of chemical pollution during construction;
- Risk of emergency over flow during construction;
- Increase in surface water run-off, creation of new drainage pathways, and impact on downstream water levels and increased demand on raw water during operation;
- Increase in erosion, increase in suspended solids in surface run-off and adverse increase in run-off pollutants during operation; and
- Change in water table level, change in groundwater availability and decrease in groundwater quality during operation.

Assessment Methodology

7.11.22 The assessment comprised the following key stages:

- Desk study and field visit to ascertain the current baseline conditions of the site;
- Consideration of the potential impacts, during both the construction and operational phase of the development, on the current baseline conditions;
- Assessment of the significance of potential impacts taking into account the sensitivity of the receiving environment and the magnitude of the potential impacts; and
- Identification of mitigation measures to minimise the potential impacts of the proposed development.

Effects

7.11.23 The impact of the proposed development has been considered in terms of the potential impact on surface water quantity, quality and impact on groundwater. The assessment of effects has been in terms of surface water; groundwater; and sewers and drainage.

Significance of Effects at Assessment Periods

7.11.24 Impacts on the water environment are likely to be of most significance during the construction period. The significance of the impacts would be closely dependent on the specific methods used to carry out the construction works.

Surface Water

7.11.25 The potential impacts on the surface water bodies during the construction phase have been assessed in terms of the impacts on water quantity and water quality.

7.11.26 The sensitivity of the River Spey and the River Druie were evaluated as high according to the sensitivity value classification identified in the previous section. The potential magnitude of the change to the water quantity was considered as moderate.

7.11.27 Consequently the impact of the construction phase on surface water quantity was assessed as medium, that is, significant and appropriate mitigation measures would be required.

7.11.28 The sensitivity of the watercourses was evaluated as high. The potential magnitude of change to the water quality was considered as major. The impact was therefore assessed as high, that is, significant and appropriate mitigation would be required.

Groundwater

7.11.29 Potential impacts on the groundwater are displayed in Table 7.11 below.

Table 7.11: Operational Impacts on Groundwater Quality and Quantity

Source of impact	Potential impact
An increase in impermeable surface areas and change in drainage pathways Increased traffic, accidental spillages	Change in water table level and groundwater availability Decrease in groundwater quality

7.11.30 The sensitivity value of the groundwater in the area was evaluated as medium according to the sensitivity value classification and the potential magnitude of the change was evaluated as moderate.

7.11.31 The impact on the local groundwater was assessed as medium, that is, significant and specific mitigation measures need to be put in place.

Sewers and Drainage

7.11.32 A new pumping station has been proposed within the development. In the case of an emergency overflow from the proposed pumping station, there would be a significant adverse impact on the water quality of both the River Spey and the River Druie.

7.11.33 The pumping station would be constructed in accordance with the requirements of Sewers for Scotland and would be operated by the Developer to Scottish Water standards and in accordance with any conditions set by SEPA until adoption by Scottish Water. Consequently the chance of an emergency overflow would be reduced and the risk to the watercourses would be negligible, that is, not significant.

7.11.34 The plans for the proposed pumping station indicate that it may be located on marshy land. If this is the case, additional consideration must be given to the storage of emergency overflow to ensure it would still comply with the requirements for Sewers for Scotland and any conditions set out by SEPA.

Mitigation

Construction Phase

7.11.35 There is a risk of impact on watercourses and groundwater during the construction phase. This risk may not be totally eliminated. However, it can be significantly reduced through the incorporation of suitable protective measures following SEPA and CIRIA technical guidance.

7.11.36 A variety of mitigation measures would be considered for this phase of the proposed development. These include:

- Development of a Construction Environmental Management Plan (CEMP);
- Site personnel awareness;
- Prevention of site pollution;
- Minimisation of site surface run-off;
- Creation of erosion and sediment controls;
- Appropriate storage of oil, fuel and chemicals;
- Alternatives to on-site concreting;
- Strategy; and
- Creation of a site restoration strategy.

Operational Phase

7.11.37 A Variety of mitigation measures would be considered for this phase of the development. These include:

- Creation of a sustainable drainage system (SUDS); and
- Separate treatment of foul water.

Significance of Residual Effects

Construction Phase

7.11.38 With the implementation of the mitigation measures described in the previous section, residual impacts on surface waters and groundwater are predicted to be insignificant, that is, not significant. The implementation of mitigation measures would reduce the moderate impacts to negligible, that is, not significant impacts. The impacts on the water quality would also be reduced. The mitigation measures would reduce the impact from major to minor/negligible, that is, not significant, which should be sufficient to protect the sensitive water environment.

Operational Phase

7.11.39 The implementation of the mitigation measures, discussed in the section above, would decrease the impact from major and moderate to negligible, that is not significant. This would provide sufficient mitigation for the negative impacts of the proposed development on the surface water, groundwater quantity and quality.

Summary

7.11.40 The impact of the development has been assessed in terms of the potential impact on surface water quantity, quality and impact on groundwater.

7.11.41 The River Spey and the River Druie have been classified by SEPA as “A1” and “A2” respectively, consequently the sensitivity of the site is ‘High’. The potential magnitude of the impact on surface water quantity and groundwater is ‘moderate’ therefore the significance of the potential impact is ‘Medium’.

7.11.42 The magnitude of impact on surface water is ‘Major’ and so the overall significance is ‘High’.

7.11.43 There is a risk of environmental impact on surface water and groundwater during the construction phase. This risk may not be totally eliminated; however it can be reduced through the incorporation of suitable protective measures following SEPA and CIRIA technical guidance. The mitigation measures would reduce the impact from major to minor/negligible, that is, not significant.

7.11.44 There is a risk of impact on surface water and groundwater during the operational phase. Through the adoption of appropriate pollution control measures and SUDS the impact can be reduced from major and moderate to negligible, that is, not significant.

7.12 SOCIO-ECONOMIC, COMMUNITY IMPACT & TOURISM and RECREATION

Introduction

7.12.1 This section provides an assessment of the potential Socio-Economic, Community, & Tourism and Recreation effects that could occur as a result of the development of the proposed project. The approach adopted in the preparation of this assessment includes a review and socio-economic and tourism profile of the existing baseline conditions in the survey area and the surrounding area. Key issues, trends and the performance of the local Aviemore economy and tourism relative to Badenoch & Strathspey and Scotland are outlined; factors influencing these conditions; and any direct and indirect effects of the proposed development. It also considers the potential impact of the proposed project upon the socio-economic, community, tourism and recreation, and business resources within the overall survey area.

Scope

7.12.2 The assessment was undertaken on the following basis and through the following stages: Baseline Assessment; Consultations; and Statement of Socio-Economic and Community Facility rationale.

Possible Effects and Inter-relationships

7.12.3 Several possible effects have been identified as relevant to the assessment of the effect on Socio-economic, Community Impact and Tourism and Recreation. No Inter-relationships have been identified.

Influence of Periods A-D

7.12.4 For the purpose of this assessment, consideration has been given to Assessment Periods A (2011) to D (2027), as indicated on the Indicative Land Use Plans.. The greatest impacts, and therefore significance, would be in the final phase, Phase D, that is, operation.

Consultations

7.12.5 Consultations were undertaken as follows:

- Identification of key consultees and local stakeholders, which were able to provide data, and their views upon key issues in the area;
- Consultation letter sent to consultees informing them of the background, purpose and remit, scope of the assessments, and seeking data and their views upon key issues in the area, and also the method of approach taken;