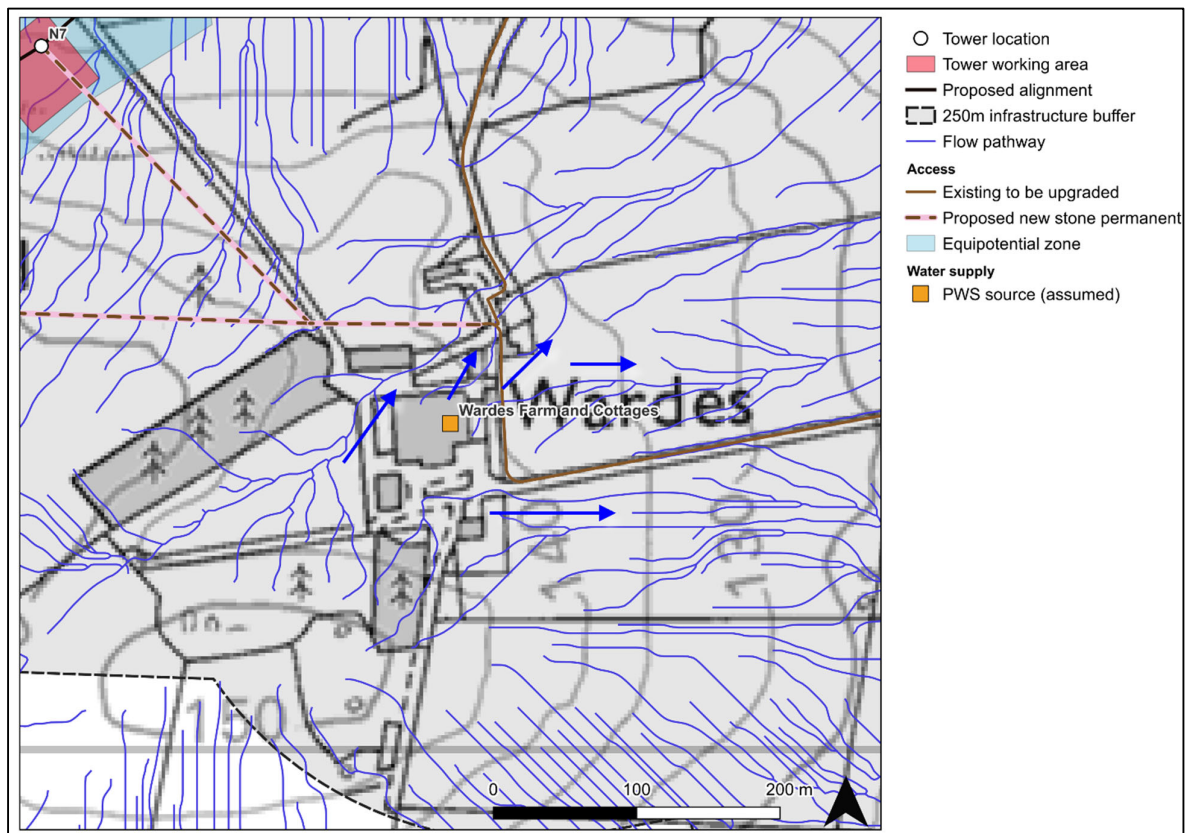


Wardes Farm and Cottages – assumed PWS

3.7.32 Wardes Farm and the surrounding cottages are likely to be served by a PWS however a lack of information from the resident and the nearby area means that this conclusion is uncertain. A questionnaire was sent to the resident but no response was received. This was followed up by several visits to the property to try to speak to the resident but the resident was not available. A Scottish Water mains pipe runs along the B977, 865 m east of the properties but there is no indication of a connection leading up to the farm. Aberdeenshire Council data indicates that Wardes Farmhouse is served by a PWS however no further information was given. The property at Hillhead, 670 m southwest of Wardes Farm, has a mains connection but this is not indicated on the Scottish Water online asset maps. The properties to the north at Leylodge Schoolhouse and Bogfold both have a PWS however these residents were clear that Wardes is not served by either supply. For the purposes of this assessment, the PWS is assumed to be at the property itself. This is shown in **Plate 13.2.40: Wardes Farm and Cottages assumed PWS, showing topography and indicative flow pathways (blue arrows).**

**Plate 13.2.40: Wardes Farm and Cottages assumed PWS, showing topography and indicative flow pathways (blue arrows).**



3.7.33 The existing access track leading up to the farm and cottages is to be utilised as part of the Proposed Development. It runs alongside the farm and past the cottages to the north and connects to a new permanent track leading to towers N7 and N8. Any potential sediment/pollution runoff during upgrades to the existing track and construction of the new track will likely flow along the existing tracks close to the two cottages to the north. During construction of the new track, runoff will drain away from Wardes Farm towards the north and east, which flows directly towards Wardes Cottages. Therefore, depending on the assumed PWS abstraction location there is potential for construction runoff to affect water quality if the source is close to the cottages. Excavations at the new permanent track have the potential to penetrate the groundwater table, potentially reducing the groundwater level in the vicinity of the properties and the farm. The magnitude of change is therefore considered to be medium.

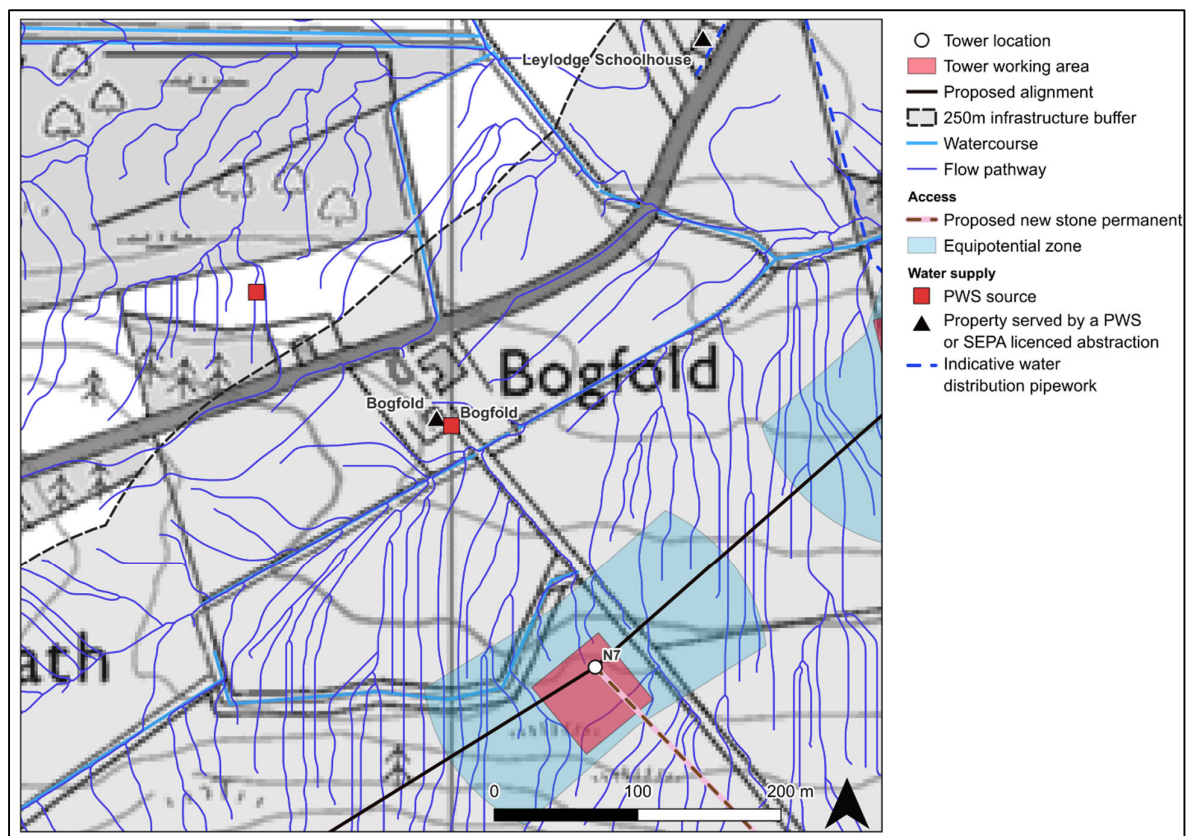
3.7.34 Further investigation into whether these properties are served by a PWS will be required before groundworks commence. The sensitivity of the assumed PWS is medium and the effect on the PWS, if present, without additional mitigation is considered to be **Moderate**.

- 3.7.35 Additional consultation will be undertaken to ascertain the exact location (if it exists) of the assumed PWS serving this property. Additional site-specific measures will be set out in the CEMP to minimise the risk of surface water runoff draining from the construction site to the watercourse/PWS source (eg swales, settlement ponds, silt fences etc). Monitoring of the assumed PWS will be undertaken before, during and after construction to check there is no contamination of the supply or change in quantity of supply. Monitoring will be undertaken by ECoW, and monitoring would likely be from the tap at the supplied property location. If the water quality deteriorates during construction (eg discoloured, high sediment content, hydrocarbons) or quantity decreases an alternative water supply will be installed at the PWS property, such as portable bowzers, to ensure minimal disruption of supply during construction. In the worst-case scenario, the Additional Mitigation will include a commitment from the Applicant to provide a new private water supply for the property or provide a connection to the Scottish Water mains.

**Bogfold PWS – Groundwater Well**

- 3.7.36 The PWS serving the property at Bogfold is a well located ~180 m northwest of the proposed tower N7 working area (**Plate 13.2.41: Bogfold PWS, showing topography and indicative flow pathways (blue arrows)**). The PWS is used for domestic and livestock purposes and the resident noted there has always been sufficient water supply. The PWS is fed into a storage tank located within the grounds of the property, close to the source. The PWS is located on the lower slopes of Drum Hill and ground levels in the area generally slope downhill northeast to the Park Burn.

**Plate 13.2.41: Bogfold PWS, showing topography and indicative flow pathways (blue arrows)**



- 3.7.37 Tower N7 would be situated upslope of the well at an elevation difference of 12 m. Therefore, any excavations around the tower and associated infrastructure would be unlikely to affect groundwater supply to the well. The underlying topography shows that the tower would drain in a northerly direction, therefore the well is not in the flow pathway and would not be affected.
- 3.7.38 Tower N8 would lie upslope of the PWS on the northern flanks of Drum Hill and there may have been surface flow paths from here towards the PWS, however the agricultural drainage ditches here between tower N8 and the PWS would capture any run-off prior to reaching the PWS, meaning that there would be a negligible magnitude of change.

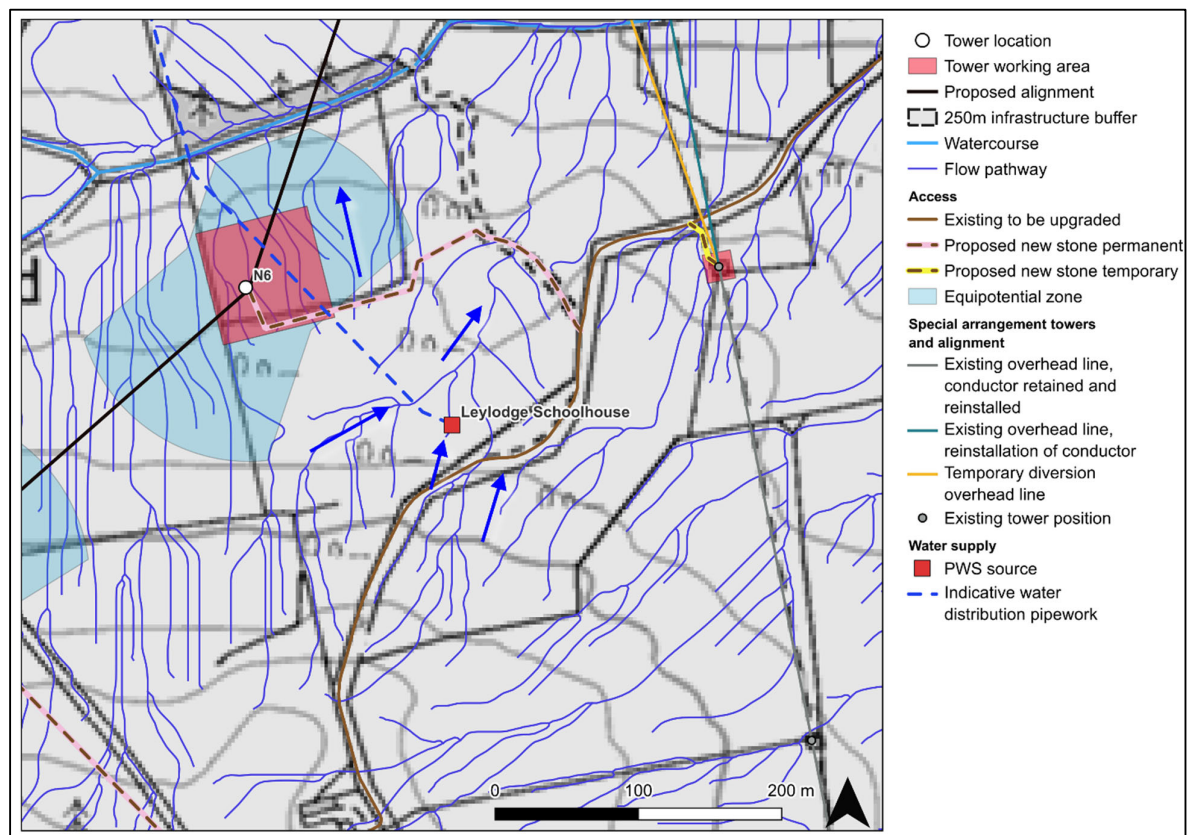
The PWS is of medium sensitivity so the effect of the Proposed Development infrastructure on the PWS is considered to be **Negligible** and no additional mitigation is required.

- 3.7.39 Monitoring of the well will be undertaken before, during and after construction. Monitoring will be undertaken from the well itself.

Leylodge Schoolhouse PWS – Groundwater Spring

- 3.7.40 Leylodge PWS is a spring located ~98 m south of the proposed permanent access track leading to tower N6 (**Plate 13.2.42: Leylodge Schoolhouse PWS, showing topography and indicative flow pathways (blue arrows), and Photo 11**). The spring is on the northern flank of Drum Hill and ground levels slope downhill to the north to the Park Burn. The spring serves five people and cattle at one property, Leylodge Schoolhouse, which is situated ~443 m northwest of the source. The resident also noted that the pipeline was installed by Aberdeenshire Council in the 1950s and that the pipe is not deep and is brittle.

**Plate 13.2.42: Leylodge Schoolhouse PWS, showing topography and indicative flow pathways (blue arrows)**





**Photo 11: Leylodge Schoolhouse spring abstraction source**



- 3.7.41 The working area of tower N6, located ~110 m northwest of the PWS abstraction, would be situated downslope of the spring at an elevation difference of ~5 m and drains north into the Park Burn. The proposed permanent access track cuts across the hill slope ~100 m north and between 3-8 m downgradient of the spring. Therefore, any excavations around the tower and associated track infrastructure may potentially affect groundwater quantity at the spring, which is assessed to be of medium magnitude. Being upslope of the Proposed Development, the spring will not be affected by surface water runoff from infrastructure. The sensitivity of the PWS is medium, hence the significance of effect on the PWS without additional mitigation is considered to be **Moderate**.
- 3.7.42 Since the tower lies directly between the spring and the property, it should be noted that it would be prudent to further consult with the resident and landowners on the exact route of the pipeline to avoid damaging the connection between the spring source and the property.
- 3.7.43 Monitoring of the PWS will be undertaken before, during and after construction to check there is no contamination of the supply or change in quantity of supply. Monitoring will be undertaken by an ECoW, and monitoring will be at tap of the supplied property. If the water quality deteriorates during construction (eg discoloured, high sediment content, hydrocarbons) or quantity decreases an alternative water supply will be installed at the PWS property, such as portable bowzers, to ensure minimal disruption of supply during construction. In the worst-case scenario, the Additional Mitigation will include a commitment from the Applicant to provide a new water supply or provide a connection to the Scottish Water mains.

## 4. SUMMARY AND CONCLUSIONS

- 4.1.1 This appendix details the assessment undertaken to identify PWS and abstractions that may be affected by the infrastructure of the Proposed Development.
- 4.1.2 Aberdeenshire Council, Aberdeen City Council, Angus Council and SEPA provided data on PWS and groundwater abstractions within 1a km buffer of the Site boundary. The Council data is caveated as the provided information cannot be guaranteed to be fully accurate, up-to-date or comprehensive. Data on PWS was also obtained through consultation with local residents and farms via questionnaires, public consultation events and property visits.
- 4.1.3 SEPA (2024) guidance on assessing the effects of developments on groundwater abstractions (including public and private water supplies) states that the relevant buffer zones for groundwater abstractions for all proposed infrastructure, both temporary and permanent are:
- 10 m for all activities;
  - 100 m radius of all subsurface activities less than 1 m in depth;
  - 250 m of all subsurface activities deeper than 1 m.
- 4.1.4 During design development any known PWS and groundwater abstractions were avoided and buffered appropriately, where possible. Given the length of the Proposed Development and the rural setting of the Site, it was not possible to meet the recommended infrastructure buffers in all cases. This assessment provides a detailed assessment of abstractions and PWS sources that are within 250 m of the proposed infrastructure. A summary of the assessment of effects and additional mitigation measure is provided in **Table 13.2.2: Summary of Effects and Additional Mitigation**. During construction, the Applicant will be cognisant of the locations of PWS sources and abstractions (and associated pipework) and will follow the site-specific mitigation to minimise potential effects, undertake monitoring and provide alternate supplies if a PWS becomes compromised. With additional mitigation, the residual effect is either **Negligible** or **Minor** for all PWS or abstractions (see final column in **Table 13.2.2**).

**Table 13.2.2: Summary of Effects and Additional Mitigation**

| PWS/Abstraction Source Name | Significance of Effect before Additional Mitigation | Additional Mitigation                                                                                                                                                                                                                            | Residual Effect                           |
|-----------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Balkemback Farm             | Negligible                                          | Monitoring before, during and after construction.                                                                                                                                                                                                | Negligible                                |
| Coldstream                  | Spring 1 - Negligible<br>Spring 2 - <b>Moderate</b> | Surface water run-off control (eg SuDS, silt fences); micro-siting of working area; monitoring before, during and after construction; provide an alternative water supply if required, eg via the existing mains connection or portable bowsers. | Spring 1 - Negligible<br>Spring 2 - Minor |
| Nether Arniefoul            | Negligible                                          | Investigation and cognisance of the distribution network before, and during construction. Monitoring before, during and after construction.                                                                                                      | Negligible                                |
| Upper Hayston Farm Cottage  | Negligible                                          | Monitoring before, during and after construction.                                                                                                                                                                                                | Negligible                                |
| Ballindarg Burn             | Negligible                                          | Monitoring before, during and after construction; if required, install an alternative water supply, eg using the existing mains connection or via portable bowsers.                                                                              | Negligible                                |
| Balmadity                   | Negligible to Minor                                 | Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowsers.                                                                    | Negligible                                |

| PWS/Abstraction Source Name    | Significance of Effect before Additional Mitigation | Additional Mitigation                                                                                                                                                                                                                 | Residual Effect     |
|--------------------------------|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Dalladies                      | Negligible                                          | Monitoring before, during and after construction.                                                                                                                                                                                     | Negligible          |
| Mains of Drumhendry            | <b>Moderate</b>                                     | Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; if required, install an alternative water supply, eg via a mains connection or portable bowzers. | Negligible to Minor |
| Whins Farm                     | <b>Moderate</b>                                     | Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction, if required, provide an alternative water supply if required, eg portable bowzers.               | Negligible to Minor |
| Cowieshill                     | Minor                                               | Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowzers, new PWS or new mains connection.                                                                              | Negligible          |
| Hairyholm                      | Minor                                               | Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; if required, install an alternative water supply, eg via a mains connection or portable bowzers. | Negligible          |
| Coldstream Farm (Laurencekirk) | Minor                                               | Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; if required, install an alternative water supply, eg via a mains connection or portable bowzers. | Negligible          |
| Coldstream Cottage             | Negligible                                          | Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; if required, install an alternative water supply, eg via a mains connection or portable bowzers. | Negligible          |
| Parkhouse                      | Negligible                                          | Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; if required, install an alternative water supply, eg via a mains connection or portable bowzers. | Negligible          |
| Thornton Estate                | Negligible                                          | Monitoring before, during and after construction.                                                                                                                                                                                     | Negligible          |
| Black Burn                     | Negligible to Minor                                 | Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg via the existing mains connection or portable bowzers.                    | Negligible          |
| Ducat Water                    | Minor                                               | Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg via the existing mains connection or portable bowzers.                    | Negligible          |

| PWS/Abstraction Source Name | Significance of Effect before Additional Mitigation | Additional Mitigation                                                                                                                                                                                                                                                                                 | Residual Effect |
|-----------------------------|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Cairnton Properties         | Negligible to Minor                                 | Further investigation to establish whether there is a PWS at the assumed locality. Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg via the existing mains connection or portable bowzers. | Negligible      |
| Cushnie Farm                | Negligible                                          | Monitoring before, during and after construction.                                                                                                                                                                                                                                                     | Negligible      |
| Burnhead of Monboddoo       | Spring - Minor<br>Stream supply – Minor             | Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowzers, new PWS or new mains connection.                                                                                        | Negligible      |
| Wattieston House            | Minor                                               | Further investigation to establish whether there is a PWS at the assumed locality, which appears likely here. Monitoring before, during and after construction; provide an alternative, suitable, water supply if required, eg portable bowzers, new PWS or new mains connection.                     | Negligible      |
| Inches Cottage and Farm     | <b>Moderate</b>                                     | Detailed investigation of the supply pipework prior to construction. Monitoring before, during and after construction; provide an alternative, suitable, water supply if required, eg portable bowzers, new PWS or new mains connection.                                                              | Minor           |
| Cotbank                     | <b>Moderate</b>                                     | Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowzers, new PWS or new mains connection.                                                                                        | Minor           |
| Jacksbank                   | Spring - Minor<br>Borehole – Minor                  | Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowzers, new PWS or new mains connection.                                                                                        | Negligible      |
| Blererno                    | Negligible                                          | Monitoring before, during and after construction.                                                                                                                                                                                                                                                     | Negligible      |
| Fetteresso                  | Negligible                                          | None.                                                                                                                                                                                                                                                                                                 | Negligible      |
| Stonehouse Cottage          | Negligible                                          | Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowzers.                                                                                                                                                                               | Negligible      |
| Tillybreak                  | Minor                                               | Surface water run-off control (eg SuDS, silt fences); monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowzers.                                                                                                                         | Negligible      |
| Monearn Lodge               | Negligible                                          | Monitoring before, during and after construction. Provide an alternative water supply if required, eg portable bowzers.                                                                                                                                                                               | Negligible      |
| Meikledams                  | Negligible                                          | Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after                                                                                                                                                                                | Negligible      |

| PWS/Abstraction Source Name                                                | Significance of Effect before Additional Mitigation                                     | Additional Mitigation                                                                                                                                                                                                                                               | Residual Effect                                                                   |
|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                                                            |                                                                                         | construction. Provide an alternative water supply if required, eg portable bowzers.                                                                                                                                                                                 |                                                                                   |
| Wester Durris                                                              | Negligible to Minor                                                                     | Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowzers. Investigation and cognisance of the distribution network before, and during construction.                                                   | Negligible to Minor                                                               |
| Woodbank Well<br>(from site visits this well does not appear to be in use) | Minor                                                                                   | Further investigation to establish whether the well is still in use will be undertaken before construction. This will inform appropriate mitigation. Monitoring and mitigation, if it is a PWS.                                                                     | Negligible to Minor                                                               |
| Park Estate                                                                | Park Estate principal supply – Minor<br>Lochwood Cottage back-up well - <b>Moderate</b> | Investigation and cognisance of the distribution network before, and during construction; monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowzers, new PWS or new mains connection.                  | Park Estate principal supply – Negligible<br><br>Lochwood Cottage - Negligible    |
| King's Well                                                                | <b>Moderate</b><br>(although this is not an issue if the well is no longer used)        | Further investigation to establish whether the well is in use will be undertaken before construction. This will inform appropriate mitigation. Monitoring and mitigation; investigation and cognisance of the distribution network before, and during construction. | Negligible to Minor<br>(to be confirmed once it confirmed whether well is in use) |
| Collonach Cottage                                                          | Minor                                                                                   | Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowzers.                                                          | Negligible                                                                        |
| Templefold                                                                 | Minor                                                                                   | Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowzers.                                                          | Negligible                                                                        |
| East Finnercy                                                              | Negligible to Minor                                                                     | Investigation and cognisance of the distribution network before, and during construction; Monitoring before, during and after construction; provide an alternative water supply during construction if required, eg portable bowzers.                               | Negligible                                                                        |
| Stepsbrae Steading/Backhill of Glack                                       | <b>Moderate</b>                                                                         | Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowzers, new PWS or new mains connection.                                                                                                            | Negligible                                                                        |
| Lauchintilly Cottage                                                       | Negligible                                                                              | Further investigation to establish whether there is a PWS at the assumed locality. Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowzers.                                                          | Negligible                                                                        |
| Wardes Farm and Cottage                                                    | <b>Moderate</b>                                                                         | Further investigation to establish whether there is a PWS at the assumed locality. Surface water run-off control (eg SuDS, silt fences); Monitoring before, during and after construction; provide an alternative water                                             | Negligible to Minor                                                               |



| PWS/Abstraction Source Name | Significance of Effect before Additional Mitigation | Additional Mitigation                                                                                                                                                                                                                              | Residual Effect     |
|-----------------------------|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
|                             |                                                     | supply if required, eg portable bowzers, new PWS or new mains connection.                                                                                                                                                                          |                     |
| Bogfold                     | Negligible                                          | Monitoring before, during and after construction.                                                                                                                                                                                                  | Negligible          |
| Leylodge Schoolhouse        | <b>Moderate</b>                                     | Investigation and cognisance of the distribution network before, and during construction; Monitoring before, during and after construction; provide an alternative water supply if required, eg portable bowzers, new PWS or new mains connection. | Negligible to Minor |