

**The Scottish Public Services Ombudsman Act 2002**

# **Investigation Report**

UNDER SECTION 15(1)(a)

**SPSO**

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## Scottish Parliament Region: West of Scotland

### Case 201302982: Scottish Water

#### Summary of Investigation

##### **Category**

Water: Customer Service; other

##### **Overview**

The complaint concerns a pumping station built by Scottish Water within the vicinity of the complainant (Mr C) and his neighbours' properties. Mr C said during the public consultation carried out prior to commencing the project, Scottish Water had provided assurances that following completion of the construction phase of the project, residents would experience no further disruption. He complained that residents had in fact suffered continuous disruption over a period of nine years. This had caused residents distress and inconvenience and had resulted in documented structural damage to some properties. Mr C said residents continued to experience noise and vibration from the pumping station and he complained that Scottish Water's actions had blighted the value of residents' properties, depriving them of a significant financial asset. He said his view was that the only permanent solution for residents was to relocate the pumping station.

##### **Specific complaints and conclusions**

The complaints which have been investigated are that Scottish Water:

- (a) unreasonably allowed vibration to continue to damage Mr C's and Mr C's neighbours' properties, without taking appropriate action over the past nine years (*upheld*);
- (b) unreasonably failed to provide a permanent solution to the problem with the pumping station over the past nine years; and (*upheld*);
- (c) unreasonably failed to give an end date for giving up and moving the pumping station to an alternative location (*not upheld*).

##### **Redress and recommendations**

The Ombudsman recommends that Scottish Water:

- (i) provide full annual structural surveys of all properties which form part of this complaint, for the

*Completion date*

18 March 2020

- next five years (if desired by residents), ensuring that the surveyor engaged has sufficient expertise to identify structural problems caused by vibration;
- (ii) implement in full any structural works identified by these surveys as resulting from the operation of the pumping station (if desired by the residents);
  - (iii) engage the District Valuer to assess the impact of the physical and reputational damage caused by the pumping station on the value of properties that form part of this complaint (if desired by residents);
  - (iv) where a reduction in value is identified, given the unique circumstances of the project, Scottish Water offer compensation to the full amount of any reduction in value (if desired by residents);
  - (v) offer to recompense the residents who have incurred fees whilst unsuccessfully attempting to sell their property between 2008 and 2014 (if desired by the residents);
  - (vi) monitor the performance, noise and vibration levels produced by the pumping station for the next 12 months, producing a monthly assessment, which should be provided to residents if requested;
  - (vii) the cumulative performance in terms of noise and vibration should be assessed after six and 12 months respectively; and
  - (viii) should either of these assessments show either extended incidents (one week or more) of noise and vibration, or repeated short incidents (more than one incident lasting ten minutes per day), then Scottish Water must inform the appropriate Minister for consideration of other viable options.
- Within three months of the survey
- 6 May 2015
- 6 June 2015
- 8 April 2015
- monthly until 18 March 2016
- 18 September 2015 and 18 March 2016
- within five working days of the deadlines for recommendation (vii)

## **Main Investigation Report**

### **Summary of contents**

1. This report is set out in a number of sections and it may be helpful to define these and the areas they cover. The Introduction provides the context to the complaint itself. This includes a brief resume of the process followed prior to the construction of the pumping station and a summary of the commitments made by Scottish Water to residents.

2. The introduction is split into three phases, reflecting the different stages the pumping station has passed through to date. The first phase (phase 1) covers the period from 2005 to 2013. This starts with the consultation and test drilling carried out by Scottish Water prior to the initial construction of the pumping station and runs to the replacement of the originally installed pumps (Pump Type A), with Pump Type B. The second phase (phase 2) encompasses the time Pump Type B was in situ and the complaints of noise and vibration it generated, from August 2013 to May 2014. The third phase (phase 3) runs from May 2014 to the date of this report, which includes the introduction of Pump Type C, initially on a trial basis, before its permanent installation.

3. The report then considers the individual complaints (a) to (c).

4. The individual complaints reflect the positions of the residents and Scottish Water as expressed during the investigation. Where appropriate, reference is made to the introduction as the evidential base for these positions, as well as my decision. I have not, however, rehearsed the facts as set out in the introduction, under the individual complaint headings.

5. Under complaint (a), I have considered the issue of structural damage to residents' properties and Scottish Water's response to the various complaints that have been made by residents. Under complaint (b), the report considers the issues which residents feel have caused them unreasonable distress and inconvenience. The issue of blight is also considered under this complaint, along with the impact the pumping station may have had on the values of property in the surrounding area. Under complaint (c), I have considered whether Scottish Water have acted reasonably as a public body in their assessment of whether a defined date should have been set, following which action would have been taken to move the pumping station.

## **Introduction**

### *Phase 1*

#### *Background*

6. Historically there had been an existing pumping station on this site for many years, however, this was small in scale and provided pumping assistance to the long sewage outfall, which discharged untreated effluent offshore. The new pumping station is significantly larger as it is required to pump effluent one and a half miles to a waste water treatment plant some 300 feet above sea level.

7. Scottish Water's reason for the siting of the pumping station was set out in a document, provided on 26 October 2005, to answer residents' concerns during the public consultation stage. This explained that the existing sewer system drained to the existing pumping station. It was not possible to change the configuration of the entire sewerage system, so a new pumping station had to be built at this location. This pumping station would pump effluent for treatment to the new waste water treatment works.

8. Scottish Water explained that the new pumping station would need to be substantially bigger than the existing plant and the site would need to be extended. There would be two relatively small structures above ground, which would house the control panel and an electrical transformer respectively. In order to meet the aim of avoiding spills a large underground storage well was required. Additional subterranean chambers were required to manage the pumping system and overflow.

9. Scottish Water explained that under normal operating conditions, the emergency overflow would only be required in the event of a major failure. The design contained safeguards to allow Scottish Water several hours before a spill occurred to rectify any failures, or put contingency measures in place. Overflow was also required in the event of heavy rainfall, since it would not be possible to pump all of these flows to the treatment works. This overflow would only operate intermittently and would release only dilute, screened sewerage. Scottish Water also noted this would require the agreement of the Scottish Environment Protection Agency (SEPA).

10. Scottish Water made a commitment in their consultation documentation that their contractors would make every effort to minimise dust, noise and vibration during the construction phase and noted that North Ayrshire Council

(the Council)'s Environmental Health Department had the powers to enforce this. Given the proximity of the construction site to properties, their contractor would use construction techniques which would limit the risk of vibration. Scottish Water would, as a precaution, offer pre and post construction surveys of neighbouring properties.

11. Scottish Water set out the public engagement work they had carried out prior to the project and their proposals for reinstating the site. They noted that whilst an access road and some well covers would be required, there would not be substantial areas of hard paving. Upon completion of the construction phase the site would be extensively landscaped to minimise its visual impact (a majority of properties affected have sea views directly over the site).

12. Scottish Water Operations would be responsible for the operation and maintenance of the pumping station once it was commissioned. They anticipated that site visits would be infrequent (no more than once a week). The activities carried out on site, whilst monitoring and maintaining the station, would not cause any disturbance to residents. Scottish Water also stated there would be no long-term noise, or odour problems from the operation of the pumping station.

13. Scottish Water provided these commitments as part of a consultation exercise they conducted with residents, prior to the planning application being submitted. Residents opposed the scheme, on the basis that the site was not suitable. Other issues raised included the scale and scope of the scheme and the likely disruption to the local area, as well as the flooding of the site and coastal erosion.

#### *Planning Committee Decision*

14. On 14 November 2005 the Council's planning committee considered an application for the erection of a control building, formation of the concrete outfall structure and a concrete hard-standing area, with associated land raising and re-grading works. The subterranean work, including the construction of the well itself, was to be carried out under permitted development legislation. Scottish Water's application was opposed by the local Community Council, and 'Beach Watch'. The Community Council disputed the claim that the work constituted permitted development and noted that SEPA had rejected the applicant's

discharge consent for the site.<sup>1</sup> The Community Council also believed the proposed storage tanks were inadequate for the demands that would be placed on them and that Scottish Water had failed to consult or engage adequately with the local community. Beach Watch also objected to the project on the grounds that the development was inadequate for the intended purpose and that anticipated overflow discharges would make it impossible for the beach to meet bathing water standards. Concern was also expressed about the lack of coastal protection afforded by the scheme.

15. Scottish Water responded to the objections, noting that the raised profile of the ground was intended as a flood prevention measure for the proposed above ground structures and that the Council's flood prevention officer had been consulted about the works. The site was part of a wider Water Treatment Scheme, which aimed to reduce discharge levels by 90 percent, which would result in an improvement in bathing water quality. Scottish Water said that engagement had been extensive with local residents and that the proposed control building would be an improvement on the existing visual amenity of the site.

16. The recommendation from the Council's Planning Department to the Council's Planning Committee was to grant the application subject to conditions. The application was granted on a vote and subject to the following conditions:

- 'That the operating hours for construction works hereby approved shall be limited to between 08:00hrs – 18:00hrs Monday to Friday and 09:00hrs -16:00hrs on Saturdays, unless [the Council], as Planning Authority gives written consent to any variation.
- That, prior to the commencement of the development hereby approved, the applicant shall submit for the written approval of [the Council] as Planning Authority details of an alternative location for the proposed transformer base.
- That prior to the commencement of the development hereby approved, the applicant shall submit for the written approval of [the Council] as Planning Authority a scheme of landscaping, which shall include details of species, planting densities, soil treatment and aftercare.
- That all planting, seeding or turfing comprised in the approved details of landscaping shall be carried out in the first planting season and seeding seasons following the occupation of the buildings or the completion of the

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<sup>1</sup> Subsequently approved on appeal to the Scottish Government

development, whichever is the sooner; and any trees or plants, which within a period of five years from the completion of the development die, are removed or become seriously damaged or diseased shall be replaced in the next planting season with others of a similar size and species, unless [the Council] as Planning Authority gives written consent to any variation.

- That any significant contamination which becomes evident during the development of the site shall be brought to the attention of North Ayrshire Council as Planning Authority together with a scheme of remediation prior to any further work taking place.'

#### *The Construction Phase*

17. During the planning and construction phase work was carried out by 'Scottish Water Solutions' rather than Scottish Water themselves. Scottish Water Solutions was set up in 2002 to work in partnership with private sector organisations, in delivering parts of Scottish Water's £1.8 billion capital investment. Scottish Water Solutions' involvement with the site finished with the commissioning of the site in 2007, when responsibility for the site transferred to Scottish Water. For clarity, however, I refer to Scottish Water throughout the report, as I consider this matter is, ultimately, their responsibility.

18. Test drilling was carried out on the site in 2005, however, this caused damage to two neighbouring properties. This damage was repaired and test drilling was discontinued. In January 2006, Scottish Water wrote to all residents informing them that they would be prepared to pay for structural surveys of their properties to be carried out pre and post construction.

19. Construction on the project began in 2006. During the construction phase vibrations from the work caused damage to eight properties in the vicinity of the pumping station. This damage took the form of cracking in the external and internal walls of the affected buildings, as well as external structures such as patios and outbuildings. Scottish Water acknowledged this was as a result of the pile driving and foundation building carried out during the construction work and paid for this damage to be repaired.

#### *Operations Commence*

20. The pumping station became fully operational in 2008, but the pumps (Pump Type A) failed on the first day. This was a valve failure, which stopped



operations and required a significant amount of work on site to recover normal operations.

21. Scottish Water were unable to supply my office with work orders or call out records for this period. They have stated that:

'It should also be recognised that some activities may have been carried out as part of the live construction project prior to going into the operational phase. As such, the contractor responsible for the construction phase may have carried out activities during the commissioning and early operational stages that we do not hold records for.'

The records Scottish Water have been able to provide, for work orders and call outs to the pumping station, commence on 24 July 2009.

22. In March 2010, a vibration survey was undertaken at one of the residential properties, after the occupants complained of vibration within their property (Report 1). The survey consisted of the placing of two digital seismographs, one inside the property and one outside. The seismographs were set to run continuously, enabling the capture of all peak vibration levels. Measurements were carried out continuously for fourteen days, and the resident was asked to diarise any incidents of vibration they were aware of.

23. Report 1 noted that by the date of the survey, Pump Type A had been modified from its original design, due to the problems it was experiencing with choking. It considered the vibration recorded against the British Standards BS 5228 (2009) and BS 7385 (1993). These standards recommend thresholds for cosmetic damage to properties in a good state of repair. Additionally readings were compared with BS 6472 (2008), which provides guidance on satisfactory magnitudes of vibration in buildings in terms of human perception and tolerance.

24. Report 1 noted that whilst levels of vibration were below the levels set by BS 6472 (2008), at which complaint was likely, this had to be considered in the light of the diaries composed by the residents. It noted that the rattling of internal fixtures such as cabinet doors and mirrors was a secondary effect of ground borne vibration and had been noted at other (unrelated) sites, even with low levels of vibration.

25. A second valve failure in 2010 resulted in the dry well pumps and control systems becoming submerged, resulting in damage from water ingress. This required the isolation valves to be replaced and the pump and control panels repaired. Scottish Water's records show eight jobs are recorded in 2010, with telemetry (a device used to remotely record and transmit data) repairs recorded on 1 March 2010, 23 November 2010 and 25 November 2010. On 24 November 2010, a call out was recorded of an attempt to de-choke the pump. Temporary pumps are recorded as being put in place on 26 November and 29 November 2010. The dry well is recorded as being flooded on 29 November 2010.

26. The third major failure was in 2011, when a brass fitting within the dry well again caused it to flood, resulting in a six month refurbishment period and dry well flood protection equipment installation. Work order records show 24 call outs in 2011, with the well flood repairs order created on 9 May 2011.

27. All three failures resulted in the installation of surface mounted pumps and a high level of activity on the site. This included the use of tanker trucks of considerable size to remove the effluent, large cranes to lift equipment on and off the site and a number of other contractors to effect repairs or carry out modifications to on-site equipment.

28. In 2008 Scottish Water had used a diesel generator to power the surface pump. Following complaints from residents and the intervention of the Council's environmental services department, Scottish Water accepted that the generator created a significant noise nuisance as it was required to run continuously. In 2010 and 2011 alterations were made to the power supply on-site ensuring that the generator could be run from mains electricity.

29. The surface pumps required the removal of the well cover to allow access to the effluent. This meant residents were exposed to foul odours from the effluent well. At points due to the failure of the pumps within the well, effluent was required to be removed by a fleet of tanker trucks. It is accepted by all parties that the size of these bowser trucks and the number required to control the levels of effluent also caused significant disruption in what is a relatively narrow, residential street.

30. Residents originally complained to Waterwatch Scotland in June 2011. They noted that the pumping station had been commissioned a few years

earlier after a very disruptive construction phase, but had been a source of constant problems. At the time of complaint (8 June 2011) both well pumps had failed and a surface pump was in place, which was described as noisy and smelly. The complaint suggested the root cause of these faults was inadequate engineering, a failure to carry spares and back up parts and the increasing likelihood the pumping station had been located in the wrong place. On 24 June 2011, Waterwatch Scotland wrote to Scottish Water requesting information on the action it had taken in response to the complaint. I note that among the areas of interest to Waterwatch Scotland were a request for confirmation that the Board of Scottish Water (the Board) were aware of the problems at this site, the issues of damage to surrounding properties due to vibration and the steps being taken to minimise vibration, noise and odour, following the Council's concerns over statutory nuisance. Waterwatch Scotland did not receive a substantive response to these questions and on 15 August 2011, responsibility for the investigation of water industry complaints was transferred to the Scottish Public Services Ombudsman, under the Public Services Reform (Scotland) Act 2010. During this office's investigation, Scottish Water commissioned a report by an expert consultant (Report 2) into the operational issues at the pumping station. The aim of this investigation was to identify the source of the problems at the pumping station and to provide practical solutions. Report 2 concluded that there was a high likelihood of vibration being transmitted through the base of the pumping station into the bedrock on which it was founded and then through this, to the surrounding properties. It recommended that a new type of pump be installed, with rubber isolators specified by the manufacturers. A new control system was to be installed for the pumps with a re-design of the suction and delivery pipework. Improvements were also identified to the remaining pipework and valve system. Further work would be required to address landscaping and coastal erosion measures and the site would require landscaping, to minimise its visual impact. On the basis that all parties were agreed that the implementation of the recommendations in Report 2 represented the appropriate way forward, my office closed its file on the case.

### *Phase 2*

31. Scottish Water accepted Report 2 and its recommendations and began to implement them in October 2012. The report considered the two key issues which needed addressing were the reliability of Pump Type A and the high likelihood of vibration from the pumps being transmitted through the base of the pumping station through to the bed rock upon which it was founded. The

vibrations were thought to travel through the bedrock into the foundations of the properties surrounding the pumping station.

32. Scottish Water's consultants commissioned a further report into noise and vibration within the properties surrounding the pumping station (Report 3), to establish whether there was a link between noise and vibration as reported by residents and pump operations and to determine whether it was of a sufficient level to cause disturbance to residents. This report was published in October 2012. Report 3 took measurements at three properties. At Property 1, closest to the pumping station, residents reported noise day and night that was audible inside and outside the property. They also reported cracks in internal plasterwork. They did not report vibration within the house, but did believe it was perceptible in the garden.

33. This investigation found that at Property 1, noise levels routinely exceeded background noise by 10 decibels (categorised by BS 4142 as 'complaints likely'). Vibration levels within this property were categorised as low, however, measuring well below BS 7385 (1993) and below the damage criteria set by the Association of Noise Consultants in their guidelines *Measurement of Ground borne Noise and Vibration*. This corresponded with the experience of the occupants, which was that noise was audible and annoying, but that they could not feel vibration within the property.

34. In Property 2, which was further up the street from the pumping station the residents stated noise and vibration in the property had only become a problem since the upgrade of the pumping station. Since 2007 the residents had monitored and reported problems with vibration to Scottish Water. Report 3 noted that in 2007 an investigation by contractors working on the pumping station had established a link between the operation of the pumps and the vibrations heard and felt in the downstairs bathroom of the property. This investigation report had not been provided to the authors of Report 3 and the residents were not in possession of a copy. Report 3 noted that Report 1 had concluded there was vibration occurring at the property, but this had not been clearly correlated with activity at the pumping station.

35. Report 3 found that the recorded vibration levels outside Property 2 were very low. It noted that it was not possible to conclude from the measurements that were taken whether the vibration associated with the pumping station was causing the reported effects within the property. Report 3 noted that the

readings had been taken under 'ideal' conditions, and it was not possible to ascertain what impact running the pumps when choking would have had on the property or the vibration levels experienced.

36. At the final property (Property 3) it was noted that noise levels were below those recommended in BS 4142 and a second criteria NANR 45<sup>2</sup> (a procedure for assessing low frequency noise complaints drawn up by the University of Salford, on behalf of the then Department for Environment, Farming and Rural Affairs) was used. Report 3 noted that these sounds as measured would be inaudible to the majority of people. This statement was, however, qualified, as differences in personal hearing thresholds were acknowledged to be significant. At low frequency, noise levels minimally above an individual threshold of audibility can cause considerable disturbance. Report 3 also noted that occupants could have been sensitised to noise, due to prolonged exposure even at levels that did not exceed current standards.

37. Report 3 did note that the low frequency noise recorded followed the activity pattern of the pumping station closely. It noted that this pattern was also visible in the external low frequency measurements but was not as pronounced as internally, which suggested internal noise was re-radiated ground borne noise. Although the level of this noise was below that audible to most people, it could not be concluded that the residents of Property 3 could not hear it, for the reasons previously suggested (sensitisation through exposure, or hearing thresholds).

38. The existing pumps (Pump Type A) were to be replaced with new pumps from a different manufacturer (Pump Type B). Scottish Water believed that Pump Type B would cope with the problems that Pump Type A had experienced with blockages caused by solid material within the pumped effluent. Additionally, at this time, Scottish Water made further commitments to residents around the landscaping and maintenance of the site. On the basis that the complainants were satisfied with these proposals in principle, my office closed our original investigation. Residents were told that should problems arise again at the site they would be entitled to request this office re-visit matters.

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<http://archive.defra.gov.uk/environment/quality/noise/research/lowfrequency/documents/nanr45-procedure.pdf>

39. In September 2013, my office was contacted by residents, again complaining that vibrations and noise in their homes had greatly increased following Pump Type B becoming operational in July 2013. Residents said that Scottish Water and their consultants were unable to explain these problems, although they were investigating.

*Pump Recirculation Test*

40. On 1 October 2013 a recirculation test was run with Pump Type B. The test used recirculation pipework and throttling valves back into the wet well to permit the pumps to run at operational speeds, without effluent being pumped up the rising main. The test results stated that the drop in vibration was marked. Prior to the test, with the pump running normally, the residents were experiencing noticeable vibration within the properties, with the worst reading recorded in the garage of Property 2. During the recirculation test and measuring at the same location, the reading was significantly lower and none of the audible / visual vibrations were apparent. The test was repeated four further times at four known 'hot spots' with similar results. The conclusion was that the major component of vibrations at the properties is directly related to flow through the rising main.

41. In December 2013 a ceiling collapsed in the bedroom of one of the properties near the pumping station.

42. By December 2013 Scottish Water had not completed the action plan they had committed to following my office's intervention in 2012. Scottish Water presented their assessment of the situation and their proposed solutions to residents on 22 January 2014. From the action plan, two actions remained outstanding in January 2014, although both were in progress.

43. A pulsation damper had been trialled and the pump speed had been capped at 1440 revolutions per minute to minimise vibrations. Vibration mapping of the street had been carried out, as well as further technical review by a recognised industry expert. Additionally intrusive investigations had taken place of the bedding arrangements for the pipeline down the street.

44. Scottish Water also set out their plan to ensure that the complaints of noise and vibration were resolved permanently. This involved further monitoring of incidents of noise and vibration to identify the root cause of the noise and vibration. This included decanting residents for three days to allow

the consultant retained by Scottish Water to measure noise and vibration to set up their equipment. Although Scottish Water had requested that three residents allow them access to their properties in order to carry out testing, only one resident had agreed to this. Testing was carried out, commencing on 1 April 2014. Full report results were not made available to residents or this office until June 2014, although they were available to Scottish Water in draft form in April 2014. I deal with the full report in greater detail from paragraph 65 onwards.

45. In April 2014 Scottish Water presented residents with the series of possible options open to them at this stage. These were categorised as 'Traditional' options and 'Innovative' options. Traditional 1 involved re-routing the rising main to the south of the pumping station and along the side of a nearby burn. This would then be connected to an existing section of the rising main. The arguments in favour of this solution were that it was relatively cheap and that a temporary overland solution could be trialled, without committing to it. Against this scheme had to be considered the impact of further works at the pumping station, and the need for further consent from SEPA, which was not guaranteed. It would also require construction work on the bank of the burn, and the rising main would still be relatively close to properties.

46. Traditional 2 proposed replacing the existing rising main with ductile iron. This would resist flex better and would, therefore, reduce the transfer of vibration into the surrounding ground. In favour of this solution was its relatively low cost, and the relatively short timescale required to implement it. The considerations against this solution were the level of disruption within the street and continued work at the pumping stations. The presentation noted this option would require significant tanker movements to extract effluent from the well. It was not clear how great the reduction in vibration transfer from this option would be.

47. Traditional 3 involved re-routing the main along the coast for approximately 1.5 kilometres. This would completely replace the existing rising main in the street and eliminate the risk of vibration being transferred to the adjacent properties from the existing rising main. Against this solution was the continued requirement for access to the site from the street, along with major disruption to residents along the whole foreshore. There were also likely to be construction risks to the project due to its proximity to the shore and this,

combined with the necessary regulatory permissions required, would lead to an extended timescale.

48. Traditional 4 would break the pump head, by introducing an additional pumping station further along the rising main, reducing the pressure required to push the effluent to the treatment plant, reducing pulsation and vibration experienced by residents. In its favour, this option could be constructed 'off-line'. Against this option was the extended timescale required for planning, land purchase, approval from SEPA and the actual construction cost. This option would also have a relatively high cost.

49. Traditional 5 involved attempting to address the problems of vibration within the houses of the residents affected. This would be the quickest option to implement and would reduce Scottish Water presence on site quickly as well. Against this option was the risk that new symptoms might reappear and the likelihood that some residents would remain dissatisfied.

50. Innovative 1, would attempt vibration suppression within the trench around the rising main itself. This would be quick to implement, but would result in significant disruption whilst work was carried out. Again the extent to which this would reduce vibration was unclear.

51. Innovative 2, required the installation of a pulsation damping device adjacent to the pumping station. This would be a low cost, quick implementation, with the potential to reduce vibration. Against these factors had to be considered the impact of further construction work at the pumping station. There was also a concern it would not deal effectively with solid matter within the effluent, leading to repeat choking in the pumps and high levels of Scottish Water activity on the site.

52. Innovative 3 considered the possibility of subterranean vibration isolation barriers within the grounds of residents' properties. This again had the potential to resolve the reported incidents of vibration. Against this was the likelihood of major construction works at either the pumping station or within the boundaries of major properties, including deep trenches. It was not certain whether these trenches would be filled or left covered. This was considered likely to be a costly solution, with uncertainty as to its effectiveness.



*Internal Briefing 6 February 2014*

53. This provided an update to Scottish Water's Chief Operating Officer on the development of the testing regime for the noise and vibration issue associated with the pumping station. It noted a meeting had been held on 5 February 2014 between Scottish Water representatives and a noise and vibration expert. This had considered a series of hypotheses and the testing regime.

54. The main hypotheses considered were the following:

- 'Reducing the pumping head, which it was hoped would reduce the pressure and pulsation effects sufficiently to minimise the resultant vibrations through the rising main.
- Pressure pulsation in rising main. Understanding the pulsation frequency variation to be able to determine if Scottish Water could do something with the pump impeller / pump type or a pulsation dampening device to reduce pressure in and pulsation in the rising main.
- Pumping station flotation. Putting additional load on the top surface of the pumping station to determine if there was any vibration between the rock strata and the pumping station.
- Ground Transmissivity – Checking if the tide level (causing saturation of the sands, soils, and rock fissures) increases the transmissivity of the source vibrations.
- Checking whether the anti-vibration mounts were actually transferring more energy and vibration into the rising main.'

55. The briefing noted Scottish Water had little robustly documented evidence on the best way forward and obtaining this was a priority. It was noted that residents in Property 2 were reluctant to complete further monitoring or logs, as they had previously carried this out. The resident of Property 3 was abroad for an extended period and did not want to allow operatives access during this period. A test regime proposal was being prepared for consideration. Scottish Water also noted that given the history of disruption on the site, any solution would need a robust evidence base to support it.

56. It was further noted that Scottish Water were meeting with a pipeline pressure / pulsation measurement company to arrange for measurements of pressure and pulsation levels to be carried out. Scottish Water were also meeting with the manufacturer of Pump Type B to engage with them in an effort

to use their expertise to understand the problem, design parameters and gain experience of where they have installed this type of pump under these conditions elsewhere in the world.

57. Further testing, following the installation of new foul transfer pumps was proposed to commence on 1 April 2014. This would involve further monitoring equipment at various locations within the street. Scottish Water requested access to Property 2 and Property 3, but were informed by residents that this was not possible. The scope of the testing was to confirm the dominant frequencies of ground borne noise within the dwelling and relate them to pump rotational frequencies. It was also intended to assess the degree of intrusion of internal ground borne noise attributable to pump operation.

#### *Internal Presentation 7 March 2014*

58. An internal presentation was made to the Chief Operating Officer, which set out the situation at the pumping station and the options available to Scottish Water. Following the vibration mapping, it produced the following range of options.

- Confirm Scottish Water were staying and take a tough line on legislative compliance. Replace fixtures and fittings which rattled. It was noted this approach would cost an estimated £100,000, would provide an immediate end to the problems on site and would risk reputational damage in the form of bad press.
- Confirm Scottish Water were not moving the pumping station and continue to work on the next level of detailed investigation. This would require on-going customer management and escalation of complaints. It was noted there was a risk that a reasonable solution would not be found. The timescale was estimated at a year and the cost as around £500,000.
- Temporarily move residents to rented accommodation whilst the problem was being resolved. This would take a year and it was estimated that the cost would be £300,000.
- Keep the pumping station on site, but move the rising main. It was noted this would not achieve total resident satisfaction and carried a risk to the organisation's reputation, as it could be portrayed as a waste of public money. The estimated time for implementing this option was two years, with a cost suggested at £2 million.

- Move the pumping station 1 kilometre up the coast. This would require tunnelling work, but would eventually guarantee resident satisfaction. Again the organisation faced a reputational risk over the charge of wasting public money. The estimated timescale was two to three years at a cost of between £6 and £8 million.

#### *Internal Briefing 24 March 2014*

59. This noted that almost all of the action plan from Report 2 had been implemented. It also reported residents had rejected the request for further post upgrade noise and vibration testing on the basis that it would not reflect a worst case scenario. Scottish Water concluded they could not do more than state this testing had been offered and hope that my office considered no more action was required on this issue.

60. Pressure monitoring of the rising main had confirmed a significant pressure pulse within the pumped fluid.

61. On 4 April 2014, a meeting was organised on behalf of residents by one of their MSPs. This was attended by a senior executive from Scottish Water. Scottish Water agreed at this meeting to meet again with all residents affected by noise and vibration from the pumping station on 29 May 2014. Scottish Water made a commitment to provide definitive solutions to eliminate noise and vibration from the affected properties at this meeting on 29 May 2014.

#### *Trial Damper Analysis*

62. Issued on 11 April 2014, this fourth report (Report 4) assessed a simulation study looking specifically at pressure pulsations. It noted that whilst dampers were used successfully in pumping operations for process plants and pipelines, they were less common on waste water rising mains. It concluded a damper could be effective and that there were, therefore, grounds for trialling one.

#### *Site testing monitoring pressure data during normal operation*

63. The fifth report assess pressure data from the pumping station during normal operation (Report 5) was based on testing carried out on site on 27 May 2014. This was to determine the magnitude of the pressure pulses with Pump Type C operating and the impact of the new damper.

64. The report was brief, with a straightforward conclusion. The findings were that the pressure pulsations were significantly larger with Pump Type B than with Pump Type C.

*Investigation of noise and vibration transmitted from the pumps*

65. The sixth report (Report 6) covered testing carried out in April 2014, when Pump Type B was in place. It was completed and passed to Scottish Water in draft form on 19 May 2014. It was not finalised until 11 June 2014. The report noted that residents' experiences were varied and that an objective measure of both noise and vibration was required. Report 6, therefore, included further detailed test results intended to define the problem.

66. Report 6 found that the pumps were causing low frequency noise at a frequency that corresponded with the pump speed and that vibration was also present in the properties tested. It considered the low frequency drumming noise recorded as a more significant disturbance than vibration, in most of the locations measured. It further noted that there were significant changes in the noise level when the pumps started and stopped and these would be a source of disturbance to residents.

67. Report 6 said it considered the disturbance through noise was most noticeable in Property 1 and to a lesser extent in Property 2 and Property 3. The report stated there was no evidence the tide had any effect on the noise levels experienced. Large changes in noise level were evident when the pumps started and stopped and these would be sufficient to provide a source of disturbance to residents.

68. It noted that noise and vibration had previously been identified as associated with pumping operations. The report noted it was accepted that ground borne levels of noise and vibration only slightly higher than the threshold level of perception could cause nuisance and result in complaints.

69. Report 6 identified two pathways for transmission of vibration, ground borne directly from the well, with the vibration being transmitted from the site of the pump, or from pressure exiting the rising main, some distance from the pump and travelling only a short distance through the ground, into the properties. The change in vibration with distance along the rising main was relatively low as opposed to the change perpendicular to the rising main, where the change in vibration was appreciable. This suggested the predominant path

for vibration transmission was a fluid-borne path initially along the rising main, before a ground borne segment between the rising main and the house foundations.

70. Report 6 noted that the pump speed had a clear effect on the level of noise experienced by residents, and that the pump speed was adjusted continuously and automatically in order to ensure an appropriate flow rate was maintained to the waste water treatment works, resulting in a constantly changing set of measurements whilst the pumping station was operating.

71. Report 6 said that Report 2 had concluded that vibration was being transmitted down through the base of the station, through to the bedrock on which it was founded. When Pump Type A was replaced by Pump Type B, Pump Type B was isolated from the mounting plinth by rubber isolators, specified by the manufacturer. The manufacturer had confirmed that the vibration from the pump running was within acceptable limits and that there was a good degree of isolation between the pump and the mounting plinth.

72. The report noted that at a preliminary site visit on 9 October 2013, the discharge pipes from the pump, which were relatively stiff, were found to be supported directly on a concrete base without vibration isolation, effectively creating a mechanical short circuit. Although a significant improvement in vibration had been measured at the base of the pump plinth, there had been no noticeable improvement in the ground borne vibration experienced by residents. This suggested that either the vibration was transmitted by the rigid pipe connections, or that it was transmitted via the rising main and pressure pulsations within this.

73. Report 6 said a feature of the rising main, was its proximity to Property 2 and Property 3. Fluid passed without attenuation from the pumps into the rising main, which caused a dynamic response in the wall of the rising main pipework. It was likely this was transmitted as vibration into the surrounding grounds and on into house foundations.

74. It had been established by the recirculation test on 1 October 2013, that a reduction of noise and vibration had taken place in the garage of Property 2 when fluid was not being pumped through the rising main. Report 6's preliminary view was that whilst it was, therefore, likely that fluid borne transmission was the dominant pathway, the efficiency of transmission through

the sandstone bedrock was unknown, and unlikely to be established, due to the extremely extensive and disruptive investigations required to measure this. The preliminary visit concluded further testing was required to establish an objective measure of the nuisance experienced by residents.

75. These tests were carried out in April 2014. The tests covered the normal range of operational pump speeds, and variations between high and low tide and the pumps starting up and shutting down, as it had already been established this could create a disturbance through sudden changes in pump speed. The tests were carried out in rooms at Property 1, Property 2 and Property 3 where residents had indicated they were experiencing disturbance. Additionally ground vibration measurements were taken externally to determine the effect of distance from the well on the level of vibration.

76. Report 6 noted that low frequency noise was assessed in line with NANR 45 and that adjustments were made for the statistical proportion of the population sensitive to noise levels outside the normal range of audibility. It was noted that there were fluctuations to the noise levels produced by the pumps, depending on their operational state.

77. Assessment of vibration was done in line with BS 6472 (1992). This contained a human perception threshold curve, which could be used to assess varied duration vibration. BS 6472 (2008) was also applied, which gives a more accurate Vibration Dose Value, which was considered to more accurately quantify the human response to vibration.

78. Report 6 found that NANR 45 was exceeded in all three properties at times during the pump operation, although it noted that in Property 3 NANR 45 was only just exceeded. Secondary noise sources were identified in Property 1 and Property 2, which were caused by objects vibrating during pump operation.

79. Report 6 then set out a systematic consideration of the mitigation options to reduce vibration within the properties. These were to try and reduce pulsation in the pressure flow at source, by changing the pump impeller type, or to reduce the pump head introducing an intermediate pumping stage. Increase attenuation in the path of the fluid by increasing the stiffness of the pipes, or isolating the rising main from the ground. Another alternative was re-routing the rising main away from the properties affected, increasing the distance vibrations had to travel. The possibility of work at the receivers (the properties affected)

was also considered but noted that these solutions were costly, difficult to deliver and might not provide sufficient mitigation to resolve the problem.

80. Report 6 set out a series of options for mitigating or removing the noise problem, which were as follows:

- 'Replace the rising main with ductile iron. This would reduce the level of flexing within the pipe itself, which it was hoped would reduce vibration transmission.
- Install a pulsation damping device. Again this was suggested as a relatively low cost, quick solution, however, it was also noted that it would not deal effectively with the pumps choking, leading to possible high levels of operational intervention.
- Break the pumping head. This involved the construction of a new subsidiary pumping station in farm land on the route of the existing rising main. This could be carried out off-line, minimising disruption, but would require an extended timescale, due to the regulatory permissions required.
- Re-route the rising main up the nearby burn. This would involve removing the existing rising main entirely from the street, and placing it on low frequency springs to absorb any vibration. Again this would require regulatory consents to be acquired, as well as further construction work at the pumping station.
- Re-route the rising main along the coast. The report acknowledged this as the only option which would guarantee the elimination of vibration in the properties currently affected. It noted that this would cause major disruption along an extended part of the foreshore. It would also have construction risks and require an extended timescale once the necessary regulatory consents were considered.
- Relocation of the pumping station. The report noted this removed the problem entirely for the residents. It made no comment on the practicalities or timescale required to implement this option.'

81. Report 6's conclusion was that the option most likely to remove the problem entirely, was to re-route the rising main along the coast, unless a different pump could be found with a significantly lower pressure-pulsation component. The report noted that low frequency noise levels would need to be measured to ensure that this was the case.

#### *Internal Briefing 20 May 2014*

82. This briefing was prepared by Scottish Water in advance of the meeting with residents on 29 May 2014. In addition to reporting on the test findings, it also contained Scottish Water's assessment of the options available to it. It set out the following actions for Scottish Water to consider:

- 'Confirm Scottish Water were staying and take a tough line on legislative compliance with noise and vibration. Replace any fixtures and fittings. This was assessed as a cost of £100,000, with risk of bad press for poor customer service.
- Re-route rising main along the nearby burn on resilient mounts. It was considered this would not achieve total customer satisfaction, would take around 9 months to complete and would cost £1.1 million.
- Re-route the rising main along the coastline. Again this would not achieve total customer satisfaction, would take around 2 years to complete and would cost £4.8 million.
- Alter the pump type. This would not achieve total customer satisfaction, would take around 16 weeks to accomplish and would cost around £195,000.
- Move the pumping station a kilometre up the coast. This guaranteed customer satisfaction but carried a reputational risk to Scottish Water, in that they could be accused of wasting public money. The estimated timescale for this was 3 to 4 years at a cost of £7 million.'

#### *Residents Meeting 29 May 2014*

83. At the meeting on 29 May 2014, Scottish Water gave a presentation, which noted that all agreed actions from Report 2 had now been completed. Scottish Water said that testing had confirmed the pressure pulsation issue and an evidence link had been found between pulsation and customer experience. Scottish Water stated they had identified Pump Type C as a possible solution, since it combined an efficient effluent handling impeller, with a lower pulsation level than Pump Type B. Pump Type C had, therefore, been installed on a trial basis, and Scottish Water believed significant improvements had been demonstrated at the known receptor sites for noise and vibration.

#### *Phase 3 – Following the Installation of Pump Type C*

84. At the meeting with residents on 29 May 2014, Scottish Water stated they were sufficiently confident of their solution and the operating capacity of Pump Type C to have ordered two permanent units with a delivery and installation



scheduled for September 2014. The two new, permanent pumps were installed in September 2014. Scottish Water informed my office that they are satisfied with the on-going performance of the pumps.

85. Since the installation of Pump Type C, Scottish Water believe they have addressed the substantive issues of noise and vibration. This is disputed by residents, who continue to complain of noise from the pumps. It is accepted there was an incident on 26 September 2014, when the pumps caused noise and vibration in properties. Scottish Water's investigation into this incident identified the cause as an unauthorised alteration to the Pump Type Control panel. This took place when the control panel was being upgraded to allow greater feedback on the station's performance. These unauthorised alterations meant the pumps ran up to their maximum speed, rather than within the window Scottish Water considered acceptable.

86. Residents continued to complain of noise and vibration in Property 2 and Property 3.

87. The complaints from Mr C which I have investigated are that Scottish Water:

- (a) unreasonably allowed vibration to continue to damage Mr C's and Mr C's neighbours' properties, without taking appropriate action over the past nine years;
- (b) unreasonably failed to provide a permanent solution to the problem with the pumping station over the past nine years; and
- (c) unreasonably failed to give an end date for giving up and moving the pumping station to an alternative location.

### **Investigation**

88. Investigation of the complaints involved reviewing the information received from Mr C and Scottish Water, as well as the records already held relating to the previous complaint investigated by this office. In addition I met with residents on site and I interviewed Scottish Water formally at this office in order to obtain further information. Additionally I obtained independent advice from my office's expert water adviser (the Adviser).

89. I have not included in this report every detail investigated but I am satisfied that no matter of significance has been overlooked. An explanation of the abbreviations used in this report is contained in Annex 1. A glossary of terms

used in this report can be found at Annex 2. A list of legislation and policies considered is at Annex 3. Mr C and Scottish Water were given an opportunity to comment on a draft of this report.

90. I note that Mr C's complaint had not completed Scottish Water's complaint procedure when he brought it to this office in October 2013. Under the Scottish Public Services Ombudsman's Act 2002, my office is normally precluded from considering complaints which have not exhausted the complaints procedure of the body complained about. In my view, however, the circumstances of this complaint are such that it would not be reasonable for Mr C to be expected to complete Scottish Water's complaints process. I note the complaint has been on-going for a considerable period of time and I note that my office's involvement in 2011 and 2012 ended on the understanding that Scottish Water had in place an action plan, which would resolve all the outstanding matters complained about. I also note that residents were assured in 2012 that should problems arise again, they would be able to bring their concerns directly to this office. The special circumstances of this case, where Scottish Waters' ongoing actions over a prolonged period of time are being considered in light of commitments given dating back to 2005, make it appropriate for me to exercise the discretion exercised the discretion available to me under the Act to conduct an investigation into all the circumstances around the construction and operation of the pumping station.

**(a) Scottish Water unreasonably allowed vibration to continue to damage Mr C's and Mr C's neighbours' properties, without taking appropriate action over the past nine years**

91. I set out the position of each party under this complaint, although I have not repeated in detail evidence previously set out in the introductory section of the report.

*Residents' Position*

92. A consistent theme of the complaints from residents in the investigation carried out in 2011 to 2012 and the current investigation has been the concern that vibration from the pumping station has caused and is continuing to cause damage to their properties. Mr C noted that damage was first caused to residents' properties during the test drilling stage in 2005, prior to the actual construction of the plant. Further damage was caused during the construction phase itself. He acknowledged that Scottish Water had, at that time, agreed to pay for the necessary repairs and that prior to the construction phase they had

surveys carried out of affected properties and that again Scottish Water had paid for repairs to damaged buildings.

93. Mr C pointed out, however, that during the consultation phase, Scottish Water had informed residents that it was highly unlikely their chosen method of construction would impact on residents and that Scottish Water's contractor would use construction techniques which would limit the risk of vibration. This had not proved to be the case.

94. Shortly after the installation of Pump Type B in August 2013, however, residents began to experience more noise and vibration within their properties. Scottish Water accepted that there was a problem and commenced investigations in September 2013. In December 2013, whilst these were ongoing, in one of the properties where there had been persistent complaints of vibration throughout the project, the bedroom ceiling collapsed during the night, injuring the occupants.

95. Scottish Water responded to the ceiling collapse by engaging contractors to carry out repairs in the affected property. A structural survey was subsequently carried out on Scottish Water's behalf. This found that there was 'no immediate concern relating to the overall stability of the property'. I note, however, that the resident concerned has reported she was informed by the surveyor that the collapse of her ceiling could not have been predicted, due to the absence of cracking in the plaster work in the period immediately preceding the collapse.

96. Although further new damage has not been identified, residents have expressed their concerns about the effect that sustained exposure to varying levels of vibration may have had on their property.

#### *Scottish Water's position*

97. Scottish Water stated that the customer impact during the construction phase was significant. They said that this was, unfortunately, inevitable when constructing a pumping station and rising main in a residential area. Scottish Water said that complaints about vibration during both the initial investigation and construction phases were to be expected when these involved intrusive ground investigation activities.

98. Scottish Water acknowledged there had been some significant damage during this phase of the project. All damage had, however, been rectified by Scottish Water, although in some cases this had taken some time. Scottish Water did not believe there was any link between these issues and the subsequent issues raised about the operation of the pumping station.

*(a) Conclusion*

99. As set out in the introduction to this report, I have considered the period covered by this complaint in three phases, given the different pump types and approaches being used by Scottish Water. I note that residents have consistently complained about the possible impact of vibration from the pumping station on the structural integrity of their properties.

100. It is accepted by all parties that during the test drilling and construction phases between 2006 and 2008, structural damage was caused to residential properties and that Scottish Water paid for the restoration of these damages. I note that Scottish Water had previously given an assurance that following the construction phase, there would be no further disruption.

101. In 2010, I note Report 1 concluded that vibration was occurring within one property, although it considered it to be of a level that was unlikely to damage the structure of the building.

102. Following the contact from my office in 2011, Scottish Water initiated a further investigation, using independent consultants. This testing again showed that noise and vibration was an issue within residents' properties.

103. Taken in isolation, Scottish Water's actions in the final phase following the problems arising from the installation of Pump Type B are, arguably, reasonable. They had commissioned independent consultants, and with the agreement of residents, had implemented the recommendations they had produced without significant amendment. The problems which then arose were unexpected.

104. I note, however, that Report 6 found that NANR 45 was exceeded in all three properties at times during the operation of Pump Type B, although it also noted that in Property 3 NANR 45 was only just exceeded. Nonetheless, the noise and vibrations recorded exceeded the guideline in all three properties.

Secondary noise sources were identified in Property 1 and Property 2, which were caused by objects vibrating during periods of pump operation.

105. The context of the current situation is, however, also a consideration, as in 2014 Report 6 found there was still evidenced of disruption to residents due to noise and vibration. It is clear residents have been concerned about the impact of vibration from the pumps since work began on the site. It is also clear in the view of the residents that Scottish Water's attempts to mitigate the problems with noise and vibration following their acceptance of the findings of Report 2 in 2012 made the situation worse. The ceiling collapse in December 2013 represented a major incident of structural damage, which could have had extremely serious consequences for the residents. Understandably, when placed in the context of the previous acknowledged damage to properties caused during the construction period, residents remain concerned the extended periods of vibration they have experienced have damaged their properties.

106. Although I note Scottish Water's comments on the unusual and unexpected nature of the problems caused by vibration, I have to consider whether or not their actions can be considered reasonable in the circumstances. In this case, I note that Scottish Water have been on-site for some nine years. Whilst they took steps following the initial construction phase to address questions of structural damage, they have not provided evidence that they have taken steps to comprehensively address this as an on-going issue for all residents.

107. It is not reasonable for this uncertainty over the impact of the operation of the pumping station to have continued for such an extended period, without Scottish Water having considered a way of addressing the issue definitively for residents. I am of the view that the situation cannot be considered resolved, until the questions of both the short and long-term impact of the operation of the pumping station on the structural integrity of properties in the vicinity has been resolved definitively.

108. Given the clear assurances provided prior to the start of the project, Scottish Water should have pro-actively sought to address residents' concerns in this area. Whilst the actions Scottish Water took in addressing the problems caused during the test drilling and construction were appropriate, their original assurances to residents have to be contrasted with their subsequent statements

to this office. Scottish Water originally gave the impression to residents that there would be a very limited chance of damage to neighbouring properties and that their contractors would have done everything possible to mitigate against this.

109. In their statement to my office, Scottish Water gave the impression that significant disruption was inevitable, with vibration an inevitable issue. It would appear, therefore, that regardless of the actions taken by the contractor, there was a real possibility of structural damage to neighbouring properties. This suggestion would appear to be supported by the damage to properties during the much less extensive test drilling that took place first.

110. I consider this significant, since it directly affects the consideration of whether Scottish Water have taken appropriate action to address the concerns residents have about structural damage to their properties. A survey has only been carried out on one property since the construction issues were resolved and its results have been questioned. Scottish Water have not recognised in their responses the disparity between their original assurances during the consultation process and the experience of residents. Nor have they recognised the inevitable concerns that further extended periods of vibration have raised, given the history of the project and the previous impact of vibration on residents.

111. I consider Scottish Water's responses overall have been inconsistent. I acknowledge that during a construction project, engineering requirements may change. I note, however, Scottish Water gave clear assurances to stakeholders during the consultation stage about the scope and impact of the project. They have subsequently stated to my office that significant disruption was inevitable during a project of this nature. This statement is not reconcilable with the impression Scottish Water sought to give stakeholders during the initial consultation and is sufficient to constitute maladministration.

112. It is also in my view clear from the evidence that Scottish Water have failed to take a consistent approach over the lifetime of the project to the issues of damage to residential properties as a result of vibration from the pumping station. As properties were damaged early in the project by vibration, it should have been apparent to Scottish Water that this would be a source of concern for residents when vibration continued after the construction phase. I consider the failure to adequately address these concerns, given the serious nature of the

damage that was sustained by one property also constitutes maladministration on the part of Scottish Water.

113. I uphold this complaint and make the following recommendations. I note that structural damage was sustained some five years after the end of the construction phase of the project. I am, therefore, recommending that (if desired by residents) Scottish Water fund full structural surveys of any of the properties which form part of this complaint, for an equivalent period from the date of this report

*(a) Recommendations*

114. I recommend that Scottish Water:
- |  | <i>Completion date</i>             |
|--|------------------------------------|
| (i) provide full annual structural surveys of all properties which form part of this complaint for the next five years, (if desired by residents) ensuring that the surveyor engaged has sufficient expertise to identify structural problems caused by vibration; and | 18 March 2020                      |
| (ii) implement in full (if desired by residents) any works identified by these surveys as resulting from the operation of the pumping station.   | within three months of the survey. |

**(b) Scottish Water unreasonably failed to provide a permanent solution to the problem with the pumping station over the past nine years**

115. For clarity, I have set out the views of both parties in turn as they have been presented to this office. I note the overlap in subject area between this complaint and complaint (c). I have, therefore, considered the impact the project has had on residents over its life-span, as well as the actions taken by Scottish Water in mitigation during this period. This includes the impact on individuals from noise and vibration, as well as the impact on the value of residents' properties and Scottish Water's proposed solutions.

116. Following the views of the two parties, I have set out the evidence available that was not detailed in the introductory section of the report. I have also set out the advice received by my complaints reviewer from the Adviser.

*The view of residents*

117. I note that although there is a single complainant in this case (Mr C), he represents a number of residents in the surrounding area of the pumping

station. In order to ascertain the views of individual residents, I conducted a series of interviews with residents on 23 July 2014. Mr C has stated clearly that he believes the pumping station is not fit for purpose and whilst it remains in place, residents will continue to experience noise and vibration. He described the vibration as affecting his ability to sleep and to enjoy the amenity of his home. Mr C believes that a permanent solution is beyond Scottish Water's capability, given the distance and height effluent has to be pumped. In his view, this means any pump will be working at the limits of its operational capacity, increasing the risk of failure and the likelihood of perceptible noise and vibration being transferred through the rising main.

118. Mr C's preferred solution, along with a number of other residents, was for the pumping station to be decommissioned, and re-located to a more suitable site. Mr C is of the view the site was never fit for purpose, and that Scottish Water had ignored reasonable objections about the suitability of the site from the start of the project. It should though be acknowledged that in the interviews, not all residents shared this view. Some felt that given their age and health, the disruption and time required to carry out any major works on the site, either rerouting the rising main, or relocating the pumping station, would be so severe over the likely three to four year timescale of works, as to outweigh any eventual benefit.

119. All residents were clear that they did not feel Scottish Water had responded appropriately or pro-actively during the first two phases of the project. There was also a consensus that Scottish Water had not taken sufficient action to recognise the impact on residents of the distress and inconvenience caused to them over the nine-year lifespan of the project.

#### *The view of Scottish Water*

120. Scottish Water have acknowledged that the project has caused significant problems and disruption. They have, though, stated that the principle aim of the project at its inception was to protect the environment from sewage discharges into the sea. From this perspective, Scottish Water believe the project has succeeded, as there have only been three short duration discharges into the sea, following failures at the pumping station. Scottish Water have stressed the need to place this in the context of the arrangements prior to 2008, when the wastewater collection system continuously discharged raw sewage into the bay via the pumping station.



121. Scottish Water stated there were always risks to conducting works in a residential area. They accepted that during a two-year period, there had been some significant disruption to residents. They also accepted that there had been some significant damage to properties during the construction phase. Scottish Water were clear that, in their view there was no direct link to the problems during the operational phase of the project.

122. Scottish Water said they had no concerns about the quality of the installation of the original pumps (Pump Type A). They believed these were the best available pumps at the time. Scottish Water said this type of pump had been used successfully elsewhere by the organisation.

123. Scottish Water said Pump Type A was provided by a well-known supplier, but although the machines were not 'bespoke' maintenance and part availability was not as simple as carrying a set of spares, which could be easily installed should a component fail. When the pumps required clearing after a severe choke, they needed to be lifted out of the well, using the internal lifting beam within the pumping station itself. When they were damaged by flooding or required more significant refurbishment, the removal of the entire pump by crane was required.

124. Scottish Water said they accepted this was highly disruptive, as was the installation of surface pumps and the use of tankers to manually empty the wells of sewerage. They were though standard in contingency plans for pump failures, since the primary responsibility was to avoid significant environmental harm.

125. In 2011 Scottish Water took the view that due to the recurrent nature of major failures within the pumping station, a new approach was required to ensure the pump was working properly. Scottish Water had, therefore, established what they described as an 'incident command' structure. The aim was to restore full operations at the site, as well as resolving all customer issues. Scottish Water said that their Board and Chief Executive were briefed about the latest incident and the recovery plan Scottish Water had put in place.

126. As part of this plan Scottish Water had instigated an independent review (Report 2) and had fully implemented the action plan subsequently produced in the expectation this would fully resolve all the issues being experienced at the site.

127. A key part of the plan had been the installation of Pump Type B. Scottish Water said they had not anticipated any problems with noise and vibration from this pump type. They did not believe that at this point vibration had been a significant feature of resident's complaints, except when Pump Type A had been choked with rags. Scottish Water, therefore, expected an improvement in the pumps' operational performance to address this issue as well.

128. Scottish Water said that Pump Type B had caused further and unexpected problems. They had responded immediately to this, launching further detailed testing. The conclusion, after extensive surveys, was that fluid pulsations within the polythene pipeline running up street, was transmitting vibrations into customers' houses. Scottish Water stated that this was a scenario they had never come across previously. Scottish Water were of the view that their current solution, following the installation of Pump Type C, would substantially resolve the issues residents were experiencing of noise and vibration.

129. During phase 1, operational issues at the site would have been the responsibility of the regional manager. The expectation was that escalation would take place when the operational activities were significantly above normal levels required for maintenance. Emergencies, such as a effluent discharge would be escalated immediately. Scottish Water took the view that residents had had a clear point of contact within the organisation throughout, although the individual had changed as the project had progressed.

130. Scottish Water said there had been regular meetings with residents since November 2013 onwards. A senior executive had briefed Scottish Water's Board in December 2013 and it had been raised each month since January 2014. Scottish Water said that the nature of their Board minutes meant that the detail of these briefings was not recorded.

131. Scottish Water stated their focus throughout the project had been to resolve the problems caused by the pumping station. They had also resolved specific problems as they occurred, when this was quantifiable and attributable to the pumping station. Scottish Water felt they had made it clear, and that residents had accepted that they would not look at the issue of compensation, until the technical problems had been addressed. In August 2014, it had been clear at a meeting with residents that compensation was also a focus for them and Scottish Water said they had taken steps to address this.

132. Scottish Water had received legal advice that there was no basis for compensation payments which specifically underwrote property values, as had been suggested by residents. Scottish Water said they were reluctant to take any action which could create a precedent that required them to pay compensation when carrying out their statutory duties. Scottish Water said they had previously suggested the involvement of the District Valuer in an effort to establish an impact on property values, but this had been rejected by residents, as they lacked confidence in the impartiality of the resulting valuations.

133. Scottish Water had, therefore, taken the view that compensation offers would be based on their standard 'price promise' scheme. For example this provides compensation for individuals whose homes were affected by internal sewage flooding. This allowed for repayment of all charges over the relevant period. Scottish Water's customer services staff were meeting with residents to listen to their grievances, and all the information received would be taken into account when making compensation offers.

134. Scottish Water accepted there had been further complaints of noise and vibration between 26 September 2014 and 2 October 2014. They said this was a source of considerable frustration, as it had been caused by alterations to the Pump Type Control panel during a necessary software upgrade. Scottish Water said the panel was now locked to prevent unauthorised alterations to the pump running speed.

135. Scottish Water said that it was unfortunate that the employee that residents had contacted about the problems had been unavailable during this period. They said that had residents contacted Scottish Water through one of their normal contact numbers, then the issue would have been responded to, since these were manned on a twenty-four hour basis.

136. Scottish Water said that in addition, they had installed an over speed alarm on the pumps linked directly to their control centre. This was in addition to the speed cap they had in place. They were actively investigating the potential for installing a device on the rising main to continually monitor the amplitude of the pulsation through it. This would allow the monitoring of long-term trends, as well as alerting them to periods of excessive vibration. Scottish Water stated that this was a unique system and they had been advised that no similar project had been attempted previously.

*Evidence available*

137. As part of my office's investigation, Scottish Water were asked to provide all board level papers relating to this case. I note that a previous request from a member of the public under Freedom of Information legislation had resulted in Scottish Water stating there was no formal record of any discussions by Scottish Water's Board. Scottish Water initially made the same statement to my office, when information was requested about the level of scrutiny the situation at the pumping station had had within the organisation.

138. Scottish Water provided this office with records that the situation at the pumping station was included in an update to the Chief Executive Officer in April 2008 and again in June 2008. There is no evidence of any further discussions or updates until August 2011, when a 'Regulatory Update' lists three complaints on the pumping station as being passed on from Waterwatch Scotland. In November 2011, these complaints are noted as having transferred to my office.

139. The cases are noted again in the update in January 2012. I note the update states that although there have been problems at the site over a number of years, the pumping station is now operating 'satisfactorily'. The note also refers to customers' concerns over structural damage to their properties and refers to an intention for further testing to be carried out by Scottish Water.

140. Further updates were provided in May 2012, although the information given to the Chief Executive Officer had not substantially changed. No further updates are evidenced until January 2014, when a more detailed update was provided to Scottish Water's Board. This consisted of information lifted directly from the reports provided to Scottish Water up to this point, informing their Board that the levels of vibration were 'lower than the British Standard levels you would normally expect to get vibration at'. As noted previously in my report, however, this remark was qualified and the failure to include these qualifying statements gives a misleading impression of residents' experiences.

141. A senior executive is recorded as providing a briefing to the Board in January 2014, on the background to the situation at the pumping station. The minutes noted that Scottish Water still needed to understand the exact causes of the vibration being experienced by residents in order to identify solutions.

142. A further update to Scottish Water's Board is noted on 27 August 2014 and it was also noted on 1 October 2014 that senior executives had met with me to answer questions about the pumping station.

143. Following receipt of Scottish Water's Board papers, my complaints reviewer noted several references to a Regional Reputation Group (RRG). Scottish Water then provided the action logs produced by this group between 2007 and 2009. The pumping station is mentioned in 2007 and 2008. The action plans lack detail and no records have been provided of what follow up was taken for each point, or the outcomes of any actions taken. I also note that the RRG's action plans for the pumping station make no mention of any consideration of impact on the residents of the incidents recorded. They also make no reference to the problems on the site caused by the levels of operational activity. Scottish Water did not provide any explanation of the role of the RRG, or of the reason it was not mentioned in any of their previous submissions to this office.

#### *Communication during the project*

144. An issue raised by the complainants during the investigation has been the nature of much of Scottish Water's communication. Residents are of the view that this has been confusing and at times deliberately misleading.

145. Residents provided correspondence between their MSP and Scottish Water, which was passed to them following enquiries made on their behalf. A public affairs officer from Scottish Water stated in April 2012 that there were no problems with the pumping station at that time and that there had been no major problems at the pumping station between May 2011 and April 2012. The pumping station was described as 'competent'. Scottish Water went on to state that the pumping station was operating within its specifications, although this could be upset by the volume of inappropriate items being put in the sewerage system.

146. Placing this response in context, the record shows a major failure of the pumps in May 2011, which resulted in surface pumps remaining in place until November 2011. There had been a further failure in March 2012, which had resulted in all night working taking place, with significant noise and disruption for residents.

147. When asked about this information by the MSP, Scottish Water issued a further response to them. This acknowledged the incidents referred to above. They also acknowledged that the operation of the surface pump and associated generator had prompted a letter to Scottish Water from the Council's Environmental Health department. This informed Scottish Water that the surface pumps were creating excessive vibration and noise. Additionally the chambers, which were now open to allow access to the pump, were causing problems with foul odours.

148. Scottish Water then set out the measures they had taken to mitigate these issues. This included dampening material under the pump itself, and an acoustic barrier around it. Steel plates were placed over the well hatches to reduce the problems with odour. Scottish Water reiterated, however, that they considered the pumping station to be competent and that all concerns from residents had been addressed and resolved.

149. I note that in response to questions from my office, Scottish Water stated that the issues arising from the surface pumps were addressed following the first incident in 2008. The impression given was that they had proactively sought to minimise the impact of works on residents.

150. Residents have complained throughout the process of delays in Scottish Water's response to both email and written correspondence. They have noted that responses have had to be chased and that the effort expended by residents in writing, telephoning and attending meetings with Scottish Water has never been adequately recognised by the organisation. Residents have noted that they are all retired and that the burden of dealing with an organisation such as Scottish Water has been particularly onerous.

#### *Advice Received*

151. I sought advice from my Adviser who is a chartered civil engineer, with 35 years' experience of working in the water industry. He has previously held senior posts with a water and sewerage company in England and now works as an independent consultant. The Adviser assessed all the technical reports provided to Scottish Water over the lifetime of the project. He also considered Scottish Water's interpretation of these reports, as expressed in the proposals put forward in their presentations to residents.

152. The Adviser said having considered the current solution implemented by Scottish Water, the reports from a consultant specialising in the assessment of the pressure amplitude within pipeline systems, following the testing carried out at the pumping station on 27 May 2014, showed using the damper reduced the amplitude of the pressure changes by around 50 percent for both pumps. The findings also show that the typical pressure changes with Pump Type C were significantly less than Pump Type B.

153. The Adviser said the pulsation simulation test showed a significant reduction in the pressure pulsation from the pump. This in turn should reduce the fluid borne transmission of vibration along the rising main. He said, however, that follow up testing would be required in order to ensure that levels of noise and vibration had improved consistently. He said that should the noise and vibration levels remain above the NANR 45 thresholds, then it would be appropriate for Scottish Water to plan for relaying the pumping main away from residential properties.

*Effect of the pumping station on property values and compensation for distress and inconvenience*

154. Scottish Water, as previously detailed, believe that any effort to anticipate the possible effect on property values of the pumping station, would be inappropriate. Their view is that they have no obligation in this respect, particularly as they were engaged in carrying out their statutory duties in respect of environmental improvements. They have also suggested that property values are not objective and can be affected by a number of different factors and the impact of the pumping station would be difficult to quantify.

155. Residents believe that it is inevitable that their property values have been diminished by the presence of the pumping station. They have provided evidence of an estate agent's opinion that a property is now effectively unsalable, due to the damage it has sustained during the last nine years (albeit that this has been repaired).

156. Another resident has attempted to sell their property twice within the last two years, as the property was no longer suitable for their needs. On both occasions the property has remained on the market for six months without any interest from buyers. Residents note that historically the street has seen properties sell quickly, without issue in obtaining the market price.

157. Residents further feel that the only offer made so far under the compensation scheme has been entirely inadequate. Although extensive impact statements were taken by Scottish Water staff, these appear to have had little bearing on the amounts offered, which have been calculated on the basis of the 'price promise' alone.

*(b) Conclusion*

158. The complaint I am considering is that Scottish Water have unreasonably failed to provide a permanent solution to the problem with the pumping station over the past nine years. It is clear that the problem on this site has been the inability over a nine-year period to install a pump which can meet the operational requirements in terms of effluent transfer reliably, without a significant impact on the amenity of neighbouring residents.

159. The effect of the persistent failures of Pump Type A and its subsequent replacements were noise and vibration directly affecting a number of residents. This has led to one incident of significant structural damage, as well as the inconvenience and distress for a predominantly retired community of being denied the amenity of the peaceful enjoyment of their property.

160. Residents also have legitimate concerns about the impact such an extended period of disruption, coupled with the accepted damage to their properties, has had on the value of their homes. Given that these are likely to be their most significant asset and given that a number of residents have indicated they wish to sell their property, this is clearly a major concern for them. I do not consider it reasonable that a public body's inability to implement a scheme that body designed and planned has been allowed to blight the lives of individual members of the public for a nine-year period.

161. I am concerned by the lack of clarity in some of Scottish Water's communication. In particular, I have noted that in response to an enquiry from an MSP Scottish Water stated inaccurately that the pumping station was working satisfactorily. I believe the evidence I have cited shows a desire on the part of Scottish Water to provide a positive response to outside scrutiny, which at times has meant they appeared to contradict themselves.

162. A direct consequence of these communication issues has been the breakdown in relations between Scottish Water and the immediate community. This has subsequently led to difficulties when Scottish Water wished to engage



with residents, for example when carrying out further monitoring. Although Scottish Water as an organisation have made increased efforts since 2013 to engage with residents, they have not been successful in re-establishing confidence in them as an organisation.

163. Scottish Water have now made efforts to address the concerns of residents regarding compensation. In my view, however, these are inadequate. Scottish Water have emphasised the exceptional nature of the problems they have encountered and cited these as justification for the length of time it has taken them to provide a solution. In my view it is not appropriate, therefore, to apply their standard compensation structure, without amendment to the situation. Although Scottish Water have underlined their commitment to finding a technical solution, before considering compensation, it should have been clear that compensation would have to be addressed earlier in the process. It is disappointing that Scottish Water did not consider their compensation process in parallel with their attempts at finding an engineering solution. It is my view that any compensation process should consider the impact of Scottish Water's actions on the value of affected properties.

164. Although I note Scottish Water's concerns about the risk of establishing a precedent that compensation should be offered, even when Scottish Water are carrying out their statutory duties, I am not persuaded by the arguments they have advanced. I do not consider that this case could be considered to set a general precedent. It relates to a set of circumstances that Scottish Water believe are unique and more pertinently, it covers a consistent failure by Scottish Water over an extended period to meet the assurances they provided to residents prior to commencing work on the site. Had these assurances been met, then I do not believe the residents would have had grounds for complaint.

165. Scottish Water developed an action plan in October 2012 to demonstrate their commitment to resolving definitively the problem they have created for residents. The evidence provided to me, however, shows that prior to this point their response to residents was inadequate. I am not persuaded that had not my office intervened, decisive action would not have been taken in an effort to resolve the problems on-site. Even since 2012, the impression from the evidence Scottish Water have provided is that the concern has always been the engineering issues on-site and that there has been no sense of urgency in addressing the issues affecting residents until the intervention of my office. I note that in April 2014, the action plan agreed in October 2012 had still not been

fully implemented. Whilst I recognise that further problems arose during the plan's implementation, the length of this delay suggests a lack of urgency in implementing the action plan, which has been to the detriment of residents.

166. I do not consider Scottish Water have taken sufficient steps to address residents' outstanding concerns regarding the impact of their actions on the value of their properties. Nor have they taken sufficient steps to address the distress and inconvenience of nine years of disruption on a community of elderly residents, some of whom suffer from serious health conditions.

167. I uphold this complaint. I appreciate that residents have previously expressed a lack of confidence in the impartiality of the District Valuer. I am of the view, however, that there is no other suitably qualified agency which can provide an impartial assessment of the value of properties.

*(b) Recommendations*

	<i>Completion date</i>
168. I recommend that Scottish Water:	
(i) engage the District Valuer to assess the impact of the physical and reputational damage caused by the pumping station on the value of properties that form part of this complaint (if desired by the resident);	6 May 2015
(ii) where a reduction in value is identified, given the unique circumstances of the project, Scottish Water offer r compensation to the full amount; and	6 June 2015
(iii) offer to recompense the residents that form part of this complaint who have incurred fees whilst unsuccessfully attempting to sell their property between 2008 and 2014.	8 April 2015

**(c) Scottish Water unreasonably failed to give an end date for giving up and moving the pumping station to an alternative location**

169. For this complaint (as previously) the views of the two parties are set out first. This is then followed by the evidence which I consider relevant, including the advice provided by the Adviser.

*The view of residents*

170. Residents believe Scottish Water are unable to deliver a final solution which can meet the guarantees provided to them during the public consultation,

that they would not experience any disruption from the pumping station once it was fully operational. Residents believe that Scottish Water did not have the appropriate level of engineering expertise to deliver the project and that they were incapable of overcoming the problems that were likely to affect the site. Residents are particularly aggrieved by this point, as they feel that their legitimate concerns were dismissed by Scottish Water based on their technical expertise. Residents now feel that their concerns have been borne out by subsequent events.

171. Residents have provided a number of examples of their previous correspondence to Scottish Water and to other relevant parties such as the Cabinet Secretary for Infrastructure and Capital Investment. In this, residents consistently call for the pumping station to be relocated, and question the wisdom of placing it in its current position. Residents feel that Scottish Water has acted 'arrogantly', by ignoring their views and refusing to consider the possibility that the original site selection had been flawed.

#### *Scottish Water's view*

172. Scottish Water's view was set out at the time of the original consultation exercise. The pumping station was to be located at its current position, since this is the point where historically the sewerage system has converged. Traditionally this discharged into the sea, hence the proximity to the shore. Locating the pumping station elsewhere would have required major works and caused even greater levels of disruption to a much greater number of people. Scottish Water have now acknowledged both that disruption was inevitable, and that the project has not gone to plan. They have, however, consistently stated that in their view, the current location remains the most suitable.

173. Scottish Water's internal assessments show that they did consider the possibility of moving the pumping station and of relaying the rising main. Both were rejected on the grounds of cost. They noted that relaying the main might not achieve customer satisfaction and that the organisation would run a reputational risk in terms of use of public money.

#### *Costs*

174. I note that Scottish Water responded to a Freedom of Information request from residents on 28 March 2014. This asked specifically for information on the costs of the project to date. Scottish Water said their figures covered the cost of the whole project, including the design and construction of the wastewater

treatment works, the new pumping station and the interconnecting rising main pipework, as well as the decommissioning of the original pumping station. They did not hold information on the costs of specific elements of the project.

175. Scottish Water said the estimated capital cost for the entire project was £8,395,200. The actual cost at January 2014 was £14,313,432. Scottish Water said that whilst there was a difference in the figures, this could not be interpreted as simplistically as a budget overrun. The figures were part of a wider context of the Scottish Water Solutions Portfolio of Works. Within this some projects had been below cost estimates, whilst others had been above. These fluctuations were, therefore, managed across £1 billion worth of capital projects between 2006 and 2010. Scottish Water acknowledged that the current estimated cost to completion of £14,372,103 did not include any further work which might be required following the completion of the vibration testing that was then underway.

176. In response to questions from my office, Scottish Water reiterated that they did not accept that this was a case of a project being allowed to continue without regard to cost controls. I note, however, that Scottish Water are unable to provide a definitive figure for costs for this aspect of the project, since work is still on-going. I also note that from Scottish Water's estimates, the cost of moving the pumping station in its entirety would have been between six and eight million pounds. The cost of relaying the rising main, would have been around two million pounds.

177. It is not the role of my office to act as an auditor and I have not, therefore pursued the cost aspect of the case, by assessing the financial controls exercised over the project. Equally I do not believe it is the role of my office to assess the relative value of the options available to Scottish Water to determine which represented best value for money. I do note that Scottish Water have suggested the cost of moving the pumping station would be excessive, given their responsibility to use public money responsibly. This seems to contradict their statement to a resident in March 2014 that the apparent difference between the original budget for the entire sewerage project and (the then) actual cost of almost six million pounds was reasonable, when viewed within the context of Scottish Water's total capital budget.

*Advice received*

178. The Adviser said that whilst he understood the frustrations of residents, the pumping station was not like a normal building, which could be removed and placed elsewhere. The original pumping station had been physically connected to the sewerage network at its termination point for discharge into the Clyde. Moving it in its entirety, was unlikely to be an engineering, economic or environmentally viable option. The Adviser did note, however, that Report 6 produced for Scottish Water had concluded that the 'safest' option, given the uncertainties around the transmission of vibration at the time the report was written, was to re-route the rising main along the coast.

179. The Adviser also noted this report had suggested an alternative solution, requiring the procurement of a different pump with a significantly lower pulsation pressure component. This was a significantly quicker, cheaper and easier option to implement and would result in less disruption to residents. This was Scottish Water's preferred option, although it required testing to evidence improvements in performance.

180. As noted previously, the Adviser concluded that whilst performance appeared to have improved from the initial tests carried out during the trial period, Scottish Water still had to evidence that Pump Type C could perform consistently under all conditions. He said that if this evidence could not be provided, then Scottish Water would have to consider relaying the pumping main away from residential properties.

*(c) Conclusion*

181. My conclusion takes into account the views of both parties. It then provides my office's assessment of the key issues identified in the investigation. These are the impact on residents to date, the cost of relocation of the pumping station and the impact on residents of relocation. I then go on to consider the Adviser's views and the statutory powers of this office.

182. I note the clearly expressed view of some residents that the only viable solution to alleviate their distress and future anxiety as well as address the issue of the impact of the pumping station on their properties, in terms of value and structural integrity, is to direct Scottish Water to move the pumping station.

183. Scottish Water's position is also clear. The position of the pumping station was chosen as the most appropriate location, given the layout of existing sewer

network. Scottish Water have acknowledged that the project has been excessively prolonged and that they have caused sustained and significant disruption to residents over a protracted period.

184. Scottish Water have expressed the view that the pumping station has fulfilled its primary requirement of reducing the substantial environmental impact of the original sewer network.

185. My main consideration in reaching a decision on this complaint has been over whether it would have been reasonable for Scottish Water to have considered moving the pumping station, given the recognised impact it has had on residents. I have received advice that the original decision to locate the pumping station there was reasonable from an engineering perspective, given the layout of the sewerage network.

186. The complaint I am determining is whether it was reasonable for Scottish Water not to set an end-date for taking a decision to move the pumping station. Scottish Water have provided evidence that they have given consideration to moving the pumping station and that they rejected this option on the grounds that they believe they have found a suitable alternative solution. Although I am critical of the failure of Scottish Water to consider contingency plans sooner, I believe they have taken into account the possibility of re-locating the pumping station. While they have decided not to do this, this remains a discretionary decision for them to take and I am satisfied they have reasonably explored viable options, including relocation. Whilst I understand the strength of some residents' disagreement with Scottish Water's decision, this is not of itself sufficient to make Scottish Water's actions unreasonable.

187. In reaching this decision I have been mindful of the Scottish Public Services Ombudsman Act (2002). In section 7 'Matters which may not be investigated'. Subsection 1 states:

(1)The Ombudsman is not entitled to question the merits of a decision taken without maladministration by or on behalf of a listed authority in the exercise of a discretion vested in that authority.

In my view the decision of which option to pursue, was a discretionary one for Scottish Water. Scottish Water do, however, have an obligation to demonstrate that their decision (whilst discretionary) has taken into account the appropriate material factors.

188. It appears the relocation of the pumping station was first considered by Scottish Water in March 2013. The cost estimates for removal and relocation of the entire pumping station would clearly be considerable. Against this must be weighed the existing expenditure by Scottish Water on the scheme. I note that Scottish Water have estimated the cost at between six and eight million pounds for relocation.

189. The relocation of the pumping station would, therefore, clearly have significant cost implications. I should make it clear, that cost alone is not sufficient reason to rule out the relocation of the pumping station. To do so on that basis, would set the precedent that a public body can essentially operate on a 'too big to fail' basis, by commencing risky projects in the knowledge that once costs have escalated sufficiently, the project will have to be completed, regardless of the on-going impact on the community or the original assurances provided to both the local authority and the community. I also note from Scottish Water's own figures, that the difference between the original estimated cost of the project and the most recent total expenditure, is greater than the cost of relaying the rising main. I also note that the timescales proposed for either of the mitigation aspects are considerably shorter than the period of time the pumping station has been causing disruption to residents.

190. It is also the case that the residents would be affected by the extensive building works required to relocate the pumping station. Some residents have indicated that due to their age and infirmity, they believe the impact of a further extended periods of works would have an unacceptable impact on their quality of life and further reduce their ability to enjoy the amenity of their homes in their retirement. Additionally, extensive works at the site would further extend the period when the possibility of selling a property within the immediate vicinity would be adversely affected.

191. A further consideration is that any potential relocation of the site would be dependent on regulatory permissions being granted. Although it is certainly possible these could be obtained, this is not guaranteed. The seeking of these permissions would need to be completed before any substantive works could begin, to allow for compliance with any conditions attached to them. This would, therefore, add a significant period of further delay and uncertainty for residents.

192. I accept some residents are of the view that whilst the pumping station remains in situ, they will be in a constant state of anxiety. This is entirely understandable given the problems detailed in this report. Additionally, the confusing and at times contradictory replies provided by Scottish Water to enquiries from residents, their elected representatives and this office, have inevitably eroded the residents trust in Scottish Water.

193. I have also noted the advice provided to this office, that should Scottish Water's latest solution fail, then it would have to be accepted that alternatives to the current position will have to be considered. Scottish Water have stated they are confident their current solution meets the necessary standards to be considered reasonable. The lack of trust residents feel in the organisation means they feel unable to accept this statement.

194. A further consideration is that, when assessing the cost of moving the pumping station these costs would ultimately be funded by public money. For that reason, I am of the view that it would not be appropriate for my office to recommend that Scottish Water consider setting a date for moving the pumping station.

195. I appreciate it will be disappointing for some residents that I am not able to order the relocation of the pumping station. I would like to emphasise that I have given considerable thought to the impact this project has had on their lives. I am also very conscious of the strength of feeling on this aspect of the case. In reaching my decision, however, I have had to assess how Scottish Water has weighed the competing views of residents, along with the likely impact of further major works. In the circumstances I do not find Scottish Water have failed take into account the appropriate material considerations, when reaching their decision.

196. I do not uphold this complaint

197. Although I have not upheld this complaint, given the advice I have received regarding the on-going performance of the pumping station and the need for Scottish Water to consider alternative solutions, I make the following recommendations. The noise and vibration levels produced by the pumping station should be monitored consistently for a twelve-month period, and assessed against the current British Standards and NANR 45 by an independent consultant. Should Scottish Water be unable to evidence that the



pumping station is capable of operating consistently under reasonable conditions without causing disruption to residents, then I recommend Scottish Water contact the appropriate Scottish Minister to allow them to review the options of relaying the rising main away from residential properties, or the relocation of the pumping station itself. The assessment of whether any measured noise and vibration meets the criteria for referral, should be carried out by the independent assessor.

(c) *Recommendations*

198. I recommend that Scottish Water:

- (i) monitor the noise and vibration levels produced by the pumping station for the next 12 months, producing a monthly assessment;
- (ii) the cumulative performance in terms of noise and vibration should be assessed after six and twelve months respectively; and
- (iii) should either of these assessments show either extended incidents (1 week or more) of noise and vibration, or repeated short incidents (more than one incident lasting ten minutes per day), then Scottish Water must inform the appropriate Minister for consideration of other viable options.

*Completion date*

monthly until 18  
March 2016

18 September 2015  
and 18 March 2016

within five working  
days of the  
deadlines for  
recommendation ii

**Explanation of abbreviations used**

Pump Type A	the first type of pump installed at the pumping station, in place from 2008 to 2012
Pump Type B	the second pump type used at the pumping station, in place from 2013 to 2014
Pump Type C	the third pump type used at the pumping station, (currently installed)
SEPA	Scottish Environment Protection Agency
The Council	North Ayrshire Council
Report 1	The first consultant's report related to vibration, noise and operational performance at the pumping station
BS	British Standard
Report 2	the second consultant's report related to noise, vibration transmission and operational performance at the pumping station
Report 3	the third consultant's report related to noise, vibration transmission and operational performance at the pumping station
Property 1	the property closest to the pumping station

Property 2	a property further near the pumping station at which monitoring of the impact of the pumping station was carried out
Property 3	the third property at which monitoring was carried out
Report 4	a report analysing the effect of a trial dampener fitted to the pump
Report 5	a report monitoring pressure created by the pumping station
Report 6	a report investigating noise and vibration created by the pumping station
Mr C	The complainant
the Adviser	The Ombudsman's water adviser
Regional Reputation Group (RRG)	an internal Scottish Water group monitoring possible sources of reputational damage, reporting to Scottish Water's Board

### Glossary of terms

BS 5228	code of practice for noise and vibration control on construction and open sites
BS 6472	guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting
BS 7385	evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration
BS 4142	methods for rating and assessing industrial and commercial sound
District Valuer	the specialist property arm of the Valuation Office Agency which provides professional independent property advice and valuations right across the public sector
effluent	liquid waste
sewage outfall	discharge point of a waste water system
NANR 45	procedure for the assessment of low frequency noise complaints
Pump Impeller	rotating component, which transfers energy from the pump motor to the fluid being pumped
Pulsation Dampener	device used to reduce pressure pulsations in pumped fluid
Vibration Dose Value (VDV)	a measure used to quantify the human response to vibration

**List of legislation and policies considered**

British Standard 4142

British Standard 5228

British Standard 6472

British Standard 7385

NANR 45

Scottish Public Services Ombudsman Act (2002)