Government Actuary's Department

Local Government Pension Scheme (Scotland)

Review of LGPS fund valuations as at 31 March 2023 under Section 13

Appendices

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Navigating risk | Cutting through complexity

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Appendix A: Compliance

A.1 In this appendix we set out the checks we conducted to determine whether the actuarial valuations of the twelve Local Government Pension Scheme (Scotland) ("LGPS Scotland") funds have been completed in accordance with the scheme regulations.

Statement of Compliance

A.2 The Government Actuary's Department (GAD) selected one fund as a representative example from each of the firms of actuarial advisors. Hymans Robertson, which acts as actuary to multiple funds, confirmed that the selected fund valuation report was representative. The following statements of compliance were contained within the chosen reports by each firm:

Table A1: Statement of Compliance

Fund	Statement of compliance
Tayside Pension Fund (Barnett Waddingham)	The purpose of the valuation is to review the financial position of the Fund and to set appropriate contribution rates for each employer in the Fund for the period from 1 April 2024 to 31 March 2027 as required under Regulation 60 of the Regulations.
Lothian Pension Fund (Hymans Robertson)	We have been commissioned by City of Edinburgh Council ("the Administering Authority") to carry out a valuation of Lothian Pension Fund ("the Fund") as at 31 March 2023. This fulfils Regulation 60 of the Local Government Pension Scheme (Scotland) Regulations 2018. This report is a summary of the valuation.
North East Scotland Pension Fund (Mercer)	This report is addressed to the Administering Authority of the North East Scotland Pension Fund ("the Administering Authority") and is provided to meet the requirements of Regulation 60 of the Local Government Pension Scheme (Scotland) Regulations 2018 (as amended) ("the Regulations"). It describes the factors considered by the Administering Authority when carrying out the actuarial valuation as at 31 March 2023 and the decisions reached as a result.

Compliance with valuation regulations

Actuarial Valuation Reports Regulation 60 (1 - 2)

A.3 Regulation 60 (1) requires the administering authority to obtain an actuarial valuation report on the assets and liabilities of each of its pension funds, including a rates and adjustments certificate, as at 31st March 2020 and on 31st March in every subsequent valuation year (i.e. 31st March 2023). Regulation 60 (2) requires that the above documents be obtained by the first anniversary of the date at which the valuation is made, namely, 31 March 2024 in the case of the 2023 valuation.

Publication

A.4 Each chosen fund was published in accordance with the regulations. The following table sets out dates of publication of the actuarial report.

Table A2: Publication date

Fund	Date of publication
Tayside Pension Fund (Barnett Waddingham)	27 March 2024
Lothian Pension Fund (Hymans Robertson)	March 2024
North East Scotland Pension Fund (Mercer)	15 March 2024

Demographic Assumptions

A.5 Regulation 60 (3) states that the actuarial valuation report must contain a statement of the demographic assumptions that have been used in making the valuation and must show how these assumptions reflect the experience that has occurred during the period since the last valuation. Each valuation report contains a section on demographic assumptions including all the assumptions that we would expect in an actuarial valuation report.

Table A3: Demographic Assumptions

Demographic	Tayside Pension Fund (Barnett Waddingham)	Lothian Pension Fund (Hymans Robertson)	North East Scotland Pension Fund (Mercer)
Pre-retirement mortality	✔	✔	✔
Post-retirement mortality	✔	✔	✔
Dependant mortality	✔	✔	✔
Ill health retirement	✔	✔	✔
Normal health retirements	✔	✔	✔
Withdrawals	✔	✔	✔
Promotional salary scale	N/A*	✔	N/A*
Family details (partners and dependants)	✔	✔	✔
50:50 option take-up	✔	✔	✔
Commutation	✔	✔	✔

*Barnett Waddingham and Mercer did not make a separate promotional salary scale assumptions and therefore effectively this was combined in their general pay increase assumption.

Local Experience

A.6 The regulation requires that the reports "must *show how* the assumptions relate to the events which have actually occurred in relation to members of the Scheme since the last valuation" in respect of the demographic assumptions. For the three chosen funds:

- All have shown differences between expectations and experience for the inter-valuation period.

Additional information on demographic experience and assumption setting may be contained in supporting (non-public) reports/advice.

Contribution Rates

A.7 Regulation 60 sets out that employer contributions are separated into two components:

- Primary rates which meet the cost of ongoing accrual for current active members; and
- Secondary rates, which are mainly established to meet deficit or eliminate surplus over a given period (the deficit/surplus recovery period).

A.8 Regulation 60 (5) states that when setting the contribution rates the actuary must have regard to:

- the existing and prospective liabilities arising from circumstances common to all those bodies,
- the desirability of maintaining as nearly constant a primary rate as possible,
- the current version of the administering authority's funding strategy mentioned in regulation 56 (funding strategy statements), and
- the requirement to secure the solvency of the pension fund and the long-term cost efficiency of the Scheme, so far as relating to the pension fund.

A.9 Regulation 60 (4) states that the rates and adjustments certificate must specify both the primary rate of the employer's contribution and the secondary rate of the employer's contribution, for each year of the period of three years beginning with 1st April in the year following that in which the valuation date falls.

A.10 Each valuation report must set out primary and secondary employer contribution rates.

Primary Rates

A.11 Regulation 60 (8) defines the primary rate of an employer's contribution as "the amount in respect of the cost of future accruals which, in the actuary's opinion, should be paid to a fund by all bodies whose employees contribute to it so as to secure its solvency", and specifies that this must be expressed as a percentage of the pay of their employees who are active members.

A.12 The following table shows the primary rate of employer contribution for the administering authorities' whole fund:

Table A4: Primary contribution rate

Fund	Primary contribution rate % of pay
Tayside Pension Fund (Barnett Waddingham)	22.5%
Lothian Pension Fund (Hymans Robertson)	25.0%
North East Scotland Pension Fund (Mercer)	20.2%

A.13 Each primary rate of employer contribution has been calculated to cover the cost of future benefits accrued by their employees. Each valuation also provides a breakdown of the primary rate for each employer.

Secondary Rates

A.14 Regulation 60 (8) states that the secondary contribution rate may be expressed as either a percentage or a monetary amount.

A.15 Each valuation report provides a secondary rate for each employer (expressed as a cash amount and/or percentage of pay for each employer). The secondary rates of employer contributions for each valuation have been defined to be adjustments to the primary rate as required. In all cases, the secondary rates have been provided for the next three years for each employer.

A.16 The following table shows the secondary rate of employer contribution for the administering authorities' whole fund:

Table A5: Whole fund Secondary Contribution Rates

Fund	2024/25	2025/26	2026/27
Tayside Pension Fund (Barnett Waddingham)	-£34,113,828	-£35,251,950	-£36,434,000
Lothian Pension Fund (Hymans Robertson)	-£73,589,000	-£75,809,000	-£78,095,000
North East Scotland Pension Fund (Mercer)	-6.2% of pensionable pay (equals -£40.8m)	-6.2% of pensionable pay (equals -£42.5m)	-6.2% of pensionable pay (equals -£44.2m)

Rates and Adjustments Certificate (Regulation 60 (6))

A.17 Regulation 60 (6) states that the rates and adjustments certificate must contain a statement of the assumptions on which the certificate is given as respects:

(a) the number of members who will become entitled to payment of pensions under the provisions of the Scheme; and

(b) the amount of the liabilities arising in respect of such members, during the period covered by the certificate.

A.18 In the following table we set out where the assumptions for each valuation can be found.

Table A6: Location of assumptions

Fund	Statement in rates and adjustments certificate	Location of assumptions in valuation report
Tayside Pension Fund (Barnett Waddingham)	✔	Appendix 2
Lothian Pension Fund (Hymans Robertson)	✔	Appendix 2
North East Scotland Pension Fund (Mercer)	✔	Appendix A

Regulation 60 (7)

A.19 Regulation 60 (7) states that the administering authority must provide the actuary preparing a valuation or a rates and adjustments certificate with the consolidated revenue account of the fund and such other information as the actuary requests.

A.20 For each of the three valuation reports examined we have seen evidence of having received relevant data from the administering authority.

Appendix B: Consistency

B.1 In this appendix we set out analysis we undertook in relation to whether the actuarial valuations were carried out in a way which is not inconsistent with other valuations completed under the scheme regulations. This appendix contains comments and a number of charts referring to the following aspects:

- Key information
- Demographic assumptions
- Climate risk

Key Information

B.2 All funds provided a standardised dashboard of results, which was originally recommended in the 2017 section 13 review and subsequently refined following the 2020 review. The agreed format of the dashboard for the 2023 valuations is as follows:

Table B1: Dashboard

Item requested	Format
Past service funding position – local funding basis	
Funding level (assets/liabilities)	*%*
Funding level (change since last valuation)	*%*
Asset value used at the valuation	*£m*
Value of liabilities (including McCloud liability)	*£m*
Surplus (deficit)	*£m*
Discount rate – past service	*% pa*
Discount rate – future service used for contribution rate setting	*% pa*
Assumed pension increases (CPI)	*% pa*
Method of derivation of discount rate, plus any changes since the previous valuation	*Freeform text*

Assumed life expectancies at age 65		
Life expectancy for current pensioners – men currently age 65	*years*	
Life expectancy for current pensioners – women currently age 65	*years*	
Life expectancy for future pensioners – men currently age 45	*years*	
Life expectancy for future pensioners – women currently age 45	*years*	
Past service funding position – SAB basis (for comparison purposes only)		
Market value of assets	*£m*	
Value of liabilities	*£m*	
Funding level on SAB basis (assets/liabilities)	*%*	
Funding level on SAB basis (change since last valuation)	*%*	
Contribution rates payable	*2023 Valuation*	*2020 Valuation*
Primary contribution rate	*% of pay*	*% of pay*
Secondary contribution - 1st year of rates and adjustment certificate	*£m*	*£m*
Secondary contribution - 2nd year of rates and adjustment certificate	*£m*	*£m*
Secondary contribution - 3rd year of rates and adjustment certificate	*£m*	*£m*
Total expected contributions - 1st year of rates and adjustment certificate (£ figure based on assumed payroll)	*£m*	*£m*
Total expected contributions – 2nd year of rates and adjustment certificate (£ figure based on assumed payroll)	*£m*	*£m*
Total expected contributions – 3rd year of rates and adjustment certificate (£ figure based on assumed payroll)	*£m*	*£m*
Assumed payroll - 1st year of rates and adjustment certificate	*£m*	*£m*
Assumed payroll – 2nd year of rates and adjustment certificate	*£m*	*£m*
Assumed payroll – 3rd year of rates and adjustment certificate	*£m*	*£m*
3-year average total employer contribution rate	*% of pay*	*% of pay*
Average employee contribution rate (% of pay)	*% of pay*	*% of pay*
Employee contributions (£ figure based on assumed payroll of £m)	*£m pa*	*£m pa*

Deficit recovery plan	*2023 Valuation*	*2020 Valuation*
Latest deficit recovery period end date, where this methodology is used by the fund's actuarial advisor	*Year*	*Year*
Earliest surplus spreading period end date, where this methodology is used by the fund's actuarial advisor	*Year*	*Year*
The time horizon end date, where this methodology is used by the fund's actuarial advisor	*Year*	*Year*
The funding plan's likelihood of success, where this methodology is used by the fund's actuarial advisor	*%*	*%*
Percentage of liabilities relating to employers with deficit recovery periods of longer than 20 years	*%*	*%*
Additional information:		
Percentage of total liabilities that are in respect of Tier 3 employers	*%*	
Included climate change analysis/comments in the 2023 valuation report	*Yes/No*	
Value of McCloud liability in the 2023 valuation report (on local funding basis)	*£m*	

B.3 All relevant information was included for the sample fund reports we considered in more detail, as listed below:

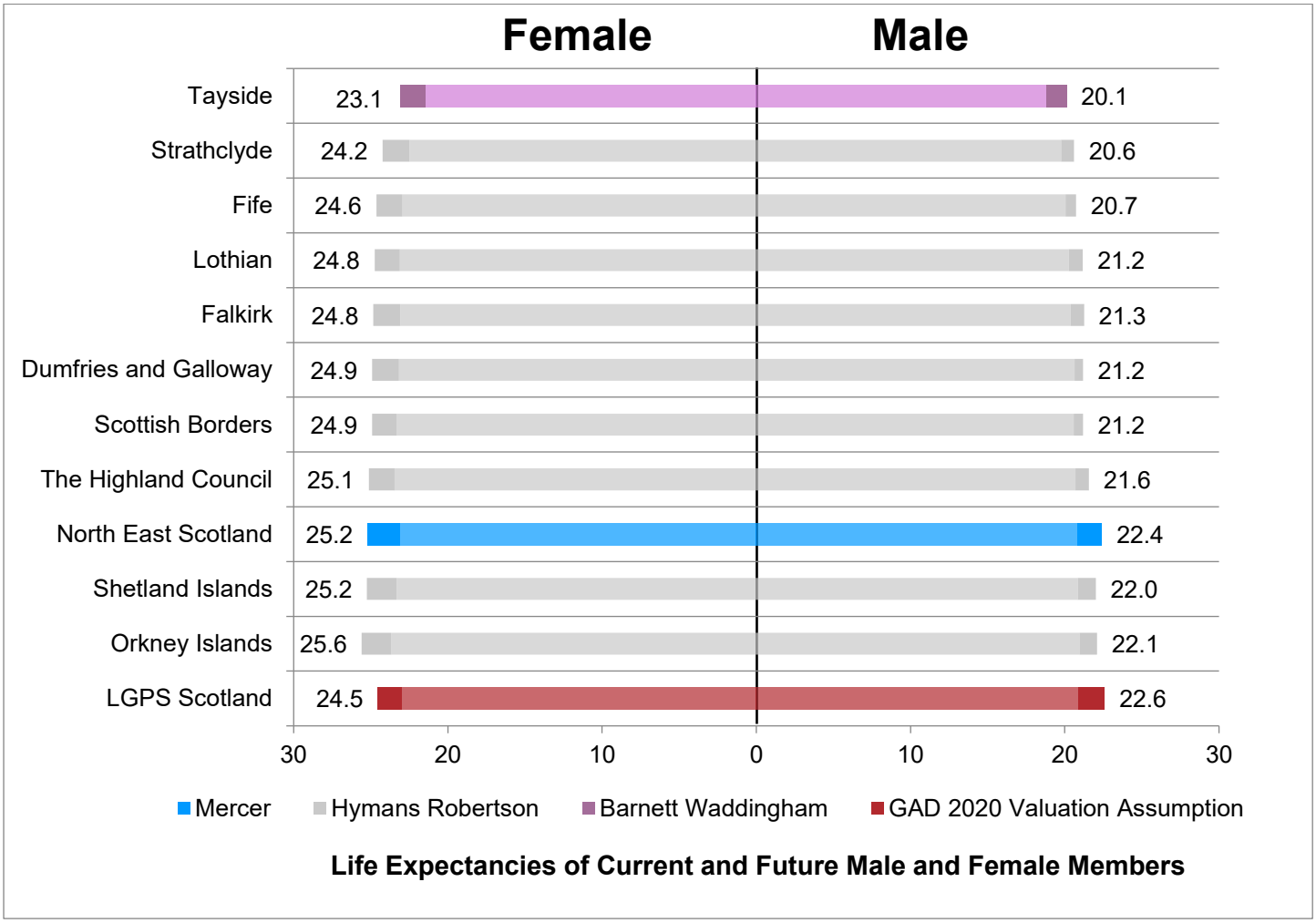
Tayside Pension Fund (Barnett Waddingham)
Lothian Pension Fund (Hymans Robertson
North East Scotland Pension Fund (Mercer)

Demographic assumptions

Post-retirement mortality

B.4 Mortality assumptions determine how long members of a fund are expected to live and hence the amount of pension benefits they will receive. The longer a members life expectancy the more pension they will receive. Chart B1 shows the life expectancy for current pensioners, female and male, at age 65, and the life expectancy for future pensioners (active and deferred member currently aged 45) at age 65. The funds are ordered by increasing future life expectancy for females. We note these assumptions will be dependent on local experience.

Chart B1: Life expectancy for pensioners and future pensioners at age 65



B.5 The paler shade in the middle of the bar represents the life expectancy of current pensioners whilst the total bar including the darker shade represents the life expectancy of future pensioners.

B.6 Chart B1 shows a consistent pattern with the findings of the LGPS England and Wales 2022 Section 13 report. This indicates that Barnett Waddingham tends to assume lower life expectancy compared to the other advisers. Similarly, the England and Wales funds advised by Mercer generally showed higher life expectancy assumptions for future pensioners, which aligns with the trend shown in this chart. The England and Wales funds also displayed greater variation in life expectancy rankings for funds advised by Hymans Robertson, which again aligns with the trend shown in this chart. However, since there is only one fund advised by Mercer and one by Barnett Waddingham in this dataset, limited conclusions can be drawn about the consistency of assumptions for these advisors.

Commutation

B.7 Commutation assumptions (the extent to which members on average exchange pension in favour of a tax-free cash benefit) are set as the percentage of the maximum commutable amount that a member can take on retirement.

B.8 Other things being equal, it is more prudent to assume a lower rate of commutation, because the cost of providing a pension benefit is higher than the commutation factor. An automatic cash lump sum was provided as of right in the LGPS prior to 2008, whereas for benefits accrued after that date cash was available only by commutation of pension.

B.9 The single fund advised by Barnett Waddingham assumes that members commute 50% of the maximum allowable cash amount for both pre-2008 and post-2008 pension. The fund advised by Mercer assumes that members take 43% of the maximum allowable cash amount for pre-2008 pension and 75% of the maximum allowable cash amount for post-2008 pension. There is variation in the commutation assumptions adopted by the funds advised by Hymans Robertson, with commutation assumptions ranging between 50% and 75% of the maximum allowable.

Climate risk

B.10 Most funds completed climate risk analysis in accordance with an agreed broad principles document. This was originally agreed between the Ministry of Housing Communities and Local Government, fund actuaries and GAD, for the purposes of the LGPS England & Wales 2022 valuations. It was subsequently agreed with SPPA that the document would also be used for the valuations of LGPS Scotland, with the results of the analyses included in the 2023 valuation reports. The broad principles agreed for the 31 March 2023 valuations are shown in B.11.

B.11 The broad principles agreed for the 31 March 2023 valuations of the LGPS Scotland are shown below.

Climate Change Valuation Reporting Principles

1. Scope of the analysis

An important part of any analysis for the valuations will be to identify the impact of transition risk (shorter term) and physical risks (longer term) on the potential funding outcomes. It is therefore critical that any analysis covers an appropriate spectrum of outcomes e.g. degree of warming/rate of transition to low carbon state and also timeframe of analysis. This is the fundamental principle of how the core analysis should be considered.

Funds will consider at the outset the scope of the analysis to be undertaken and the scenarios to be considered at the Whole Fund level, comprising at least two alternate scenarios covering differing rates of transition. These may be considered relative to a base scenario with only implicit adjustment to assumptions for scenarios, which include varying degrees of climate change transition, consistent with the funding assumptions. This might be used, for example, to test whether the funding strategy is sufficiently robust in the context of the scenario analysis considered and therefore any potential contribution impacts.

This also should be supported by qualitative commentary on what potential actions are being taken to improve resilience to climate change and the potential implications. For example the path to net zero and any interim targets, and how they correspond to the scenarios modelled. Where action has already been taken, Funds may request some analysis to quantify the impact retrospectively if they wish (although we would expect this work to be done by the investment consultant or custodian).

2. Scenarios to be considered

- One of the scenarios will be Paris aligned scenario and there will be at least one other scenario consistent with a higher temperature outcome.
- Funds should consider both the projected potential global average temperature rise, and the nature of the transition to that temperature rise (e.g. timing and level of disruption).
- Ultimately Funds will take advice from their Fund Actuary (and other advisers as appropriate) on the analysis to be undertaken as part of the valuation.
- The detailed method and assumptions underpinning the climate change scenarios is not prescribed and will be determined by Funds working with their advisers based on their own plans to address climate change. However, as an example, the following impacts may be considered:
  - the potential impact on the future investment return outlook (and therefore discount rate) and inflation (and therefore inflation-linked assumptions), for the purpose of projecting liability values; and
  - the impact on the investment returns delivered by the Fund's investment strategy for the purpose of projecting asset values
- Funds could also consider with their advisers the extent to which the scenarios will consider additional elements such as the potential impact on life expectancy changes and employer covenant.
- As well as Funds having different approaches to dealing with climate change in their portfolio construction, it is recognised that different actuarial firms/GAD will legitimately have differing views on the methodology and assumptions underpinning different climate change scenarios although we would expect some commonality here.

3. Time horizon and output

The output from the scenarios will include consideration of the results (which will include the funding level on each scenario modelled) over a period of at least 20 years to ensure there is sufficient recognition of the transition and physical risks of climate change.

To ensure consistency with other reporting requirements, if a Fund chooses to do so then separate analysis could be undertaken to be consistent with the expected TCFD requirements i.e. giving consideration to the short, medium and long term impacts, but this would be subject to the final TCFD requirements for the LGPS.

4. Reporting

- The Fund Actuary will summarise the analysis/commentary in the final valuation report, including the headline assumptions underpinning the analysis, in line with the profession's expectations. Limited reporting in an agreed format could be included in the dashboard for consideration by GAD for Section 13 reporting requirements, though given the different possible approaches and scenarios the results may not be directly comparable.
- We recommend that Funds include in their Funding Strategy Statement a statement that the Fund has undertaken scenario analysis to assess the resilience of the strategy against climate change risk over the agreed period.

Appendix C: Solvency

C.1 In this appendix we set out the analysis we undertook in relation to whether the rate of employer contributions to the LGPS Scotland pension fund is set at an appropriate level to ensure the solvency of the pension fund. This appendix contains a description of:

- Solvency considerations
- Mapping of solvency considerations to measures adopted
- Methodology used for solvency measures

Potential for default

C.2 In the context of the LGPS Scotland:

- Our understanding based on confirmation from SPPA is that, in contrast to employers in the private sector, there is no insolvency regime for local authorities.
- Therefore, for the purposes of our analysis we assume that local authority sponsors cannot default on their pension liabilities through failure.
- Members' benefits are therefore dependent on the assets of the scheme and future contributions from employers including local authorities.

Solvency considerations

C.3 In assessing whether the conditions for solvency are met, we will have regard to:

Risks already present:

- funding level on the SAB standard basis.
- whether or not the fund continues to be open to new members. If the fund is closed to new members or is highly mature and without any guarantee in place, we will focus on the ability to meet additional cash contributions.
- the proportion of scheme employers without tax raising powers or without statutory backing.
- the ability of tax raising authorities to meet employer contributions.

Emerging risks:

- the risks posed by changes to the value of scheme assets (to the extent that these are not matched by changes to the scheme liabilities).

Mapping of solvency considerations

C.4 The four solvency metrics that were adopted for the 2020 exercise have been retained for the 2023 exercise. We developed and considered other measures but did not believe these would add value under current circumstances.

Table C1: 2023 solvency measures

Consideration	Measure Used
Risks already present:	
The relative ability of the fund to meet its accrued liabilities.	**Relative SAB funding level:** A fund's funding level using the SAB standard basis, as set out in Appendix F.
The extent to which the fund continues to be open to new members. If a fund is closed to new members or is highly mature, we will focus on the ability to meet additional cash contributions.	**Open fund:** Whether the fund is open to new members.
The proportion of scheme employers without tax raising powers or without statutory backing.	**Non-statutory members:** The proportion of members within the fund who are/were employed by an employer without tax raising powers or statutory backing.
Emerging risks:	
The cost risks posed by changes to the value of scheme assets (to the extent that these are not matched by changes to the scheme liabilities).	**Asset shock:** The change in average employer contribution rates expressed as a percentage of pensionable pay after a 15% fall in value of return-seeking assets.

C.5 Emerging risk measures require assumptions. We used best estimate assumptions for this purpose, details of which can be found in Appendix F. Details of the methods used to calculate scores under each measure and the criteria used to assign a colour code can be found in this appendix.

Solvency measures – methodology

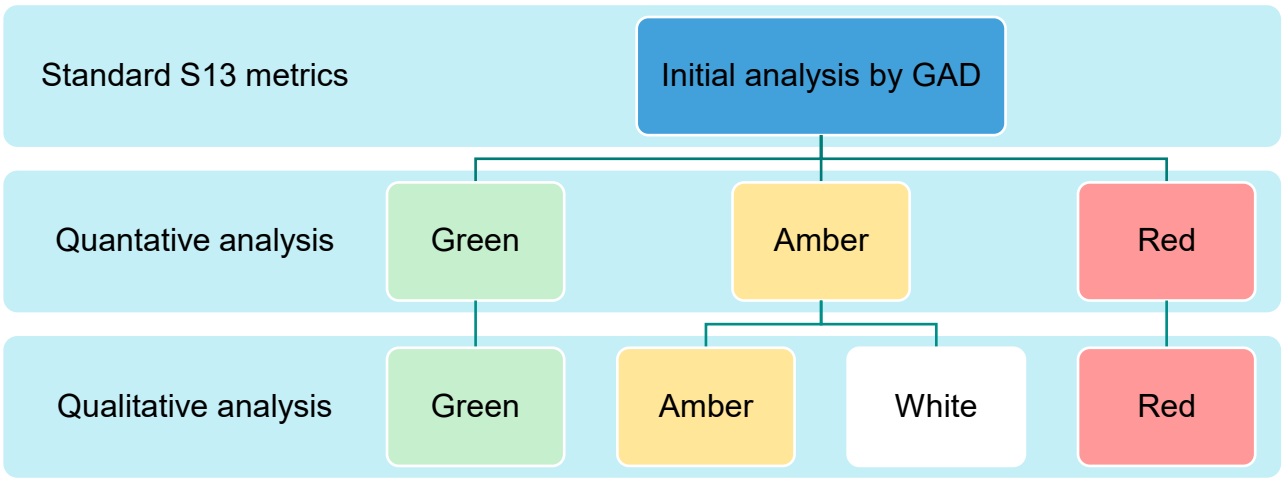
C.6 We detail the methodology behind the measures used to assess a fund's solvency position. The analysis is carried out a fund level, except where stated, but individual employers within any fund may be in a different position. Some of the measures listed below were calculated using a market consistent set of assumptions. For more information on this best estimate basis please see Appendix F.

C.7 The 2017 section 13 exercise developed the approach of setting red, amber and green ('RAG') flags for the solvency measure, where amber and red flags were raised when a fund breached thresholds set by GAD. For the 2020 and 2023 exercises, GAD has adopted the same RAG approach, however the flag allocations have been revised since 2017 taking into account the following:

- The scheme funding position has improved significantly since 2017 when the metrics were introduced;
- The size of funds has grown considerably since 2017 but the ability of tax backed employers to increase contributions if required has not kept pace. This could pose a risk to the LGPS Scotland, for example if there is a severe shock to return seeking asset classes.

C.8 Following discussions with SPPA, GAD agreed that it is not helpful to raise individual fund flags in some circumstances and introduced the "white" flag at the 2020 exercise. The white flag is an advisory flag that highlights a general risk but does not require action in isolation.

C.9 The chart below illustrates the steps taken by GAD in determining the flag colours for the metrics.



C.10 The text box below defines each flag colour.

C.11 GAD will assess the position again at the time of the 2026 section 13 report and will decide whether to retain the white flag, return to the RAG approach, or use other metrics/thresholds that are appropriate for the circumstances of the LGPS Scotland at that point in time.

Key

RED indicates a material issue that may result in the aims of section 13 not being met. In such circumstances remedial action to ensure solvency may be considered.

AMBER indicates a potential material issue that we would expect funds' to be aware of. In isolation this would not usually contribute to a recommendation for remedial action in order to ensure solvency.

WHITE is an advisory flag that highlights a general issue but one which does not require an action in isolation. It may have been an amber flag if we had broader concerns.

GREEN indicates that there are no material issues that may contribute to a recommendation for remedial action in order to ensure solvency.

SAB funding level: A fund's funding level using the SAB standard basis

C.12 This measure highlights possible risks to a fund as a result of assets being significantly lower than liabilities, where liabilities are those estimated on the SAB standard basis detailed in Appendix F.

C.13 A fund in deficit will need to pay additional contributions in order to meet the liabilities that have already been accrued.

C.14 This measure assesses the relative funding levels of individual funds.

Open fund: Whether the fund is open to new members

C.15 A scheme that is closed to new members will be closer to maturity than a scheme which is still open. This creates a possible risk to sponsoring employers as there is less scope to make regular contributions and receive investment returns on those contributions. Additionally, if problems do occur with the scheme funding level, the reduced time to maturity of the scheme means that additional contributions must be spread over a shorter timeframe and could be more volatile as a result.

C.16 This measure is a 'Yes' when a fund is still open to new members and a 'No' otherwise. A 'Yes' results in a green colour code, while a 'No' results in a red colour code.

C.17 As at 31 March 2023, the Scottish Homes Pension Fund is the only closed fund in LGPS Scotland. However, given that this fund has a Scottish Government guarantee we do not consider it appropriate to set the flag to red and so have awarded a green flag.

Non-statutory members: The proportion of members within the fund who are employed by an employer without tax raising powers or statutory backing

C.18 We have considered taxpayer-backed employers of stronger covenant value than other employers. It is important, in this context, that administering authorities and other employers understand the potential cost that may fall on taxpayers in the future if employers without statutory backing or tax raising powers are unable to meet their required contributions and those with such powers become responsible for the accrued costs.

C.19 Data for this measure has been provided by the actuarial firms.

C.20 Under this measure a fund has been allocated an amber colour code if its proportion of members who are employed by an employer without tax raising powers or statutory backing is between 25% and 50%, a red colour code would be allocated if the proportion is more than 50% and a green colour code is allocated in all other cases.

Asset shock: The change in average employer contribution rates expressed as a percentage of pensionable pay after a 15% fall in value of return-seeking assets

C.21 This measure shows the effect on total employer contribution rates of a one-off decrease in the value of a fund's return seeking assets equal to 15% of the value of those assets expressed as a percentage of pensionable pay. Defensive assets are assumed to be unaffected.

C.22 For the purposes of this measure liabilities have been restated on the standardised best estimate basis and deficit recovery periods have been standardised using a period of 20 years to ensure that results are comparable. Where a fund is in surplus under the best estimate basis, the surplus is assumed to be paid back to the employer over a period of 20 years.

C.23 For the scenario where a fund is in deficit on the standardised best estimate basis after the asset shock (the funding level is less than 100% after the shock) and the relevant threshold has been breached (over 3%) as described below, then an initial amber flag is raised. However, where the fund is in surplus after the shock, the fund will not raise a flag even if it had breached the threshold but the risk remains that such an event could bring forward the need to increase contributions.

C.24 Return-seeking asset classes are assumed to be:

- Equities (UK, Overseas and Unquoted or private equities).
- Property.
- Infrastructure investments which are equity type.
- "Multi asset" funds (examples include diversified growth funds, managed funds, balanced funds, multi asset credit or absolute returns).
- "Other" return seeking investments.
- Defensive asset classes, which are less volatile but may still generate a return, are assumed to be:
- Cash.
- Bonds (Gilts, Corporate Bonds or index linked).
- "Other" defensive investments.

C.25 We calculated the emerging deficit from the shock following a 15% fall in return seeking assets:

$$\text{New Deficit} = (\text{Pre stress asset value} - \text{post stress asset value})$$

We spread this over 20 years of annual payments and express as a percentage of pensionable pay:

$$\frac{\text{New Deficit}}{\bar{a}_{20} \times \text{Pensionable Pay}}$$

Where:

- new deficit is calculated on the standardised best estimate basis as at 31 March 2023.
- $\bar{a}_{20}$ is a continuous annuity over the 20-year deficit recovery period at the rate of interest equal to $\frac{(1+i)}{(1+e)} - 1$.
- i is the nominal discount rate assumption on the standardised best estimate basis.
- e is the general earnings inflation assumption on the standardised best estimate basis.

C.26 A fund is allocated a red flag if its result is above 7.5%, an amber flag if its result is above 5% and a green flag otherwise.

C.27 The asset shock reduces the funding level of the funds, on the best estimate basis. If a fund was in surplus post-shock (that is, the funding level was in excess of 100% after the shock) the fund is allocated a green flag. The table of results in the section 13 report includes the position for the funds following the asset shock and the effect of the asset shock on contribution levels.

Appendix D: Long term cost efficiency

D.1 We developed a series of relative and absolute considerations to help assess whether the contributions met the aims of section 13 under long term cost efficiency. This appendix contains a description of:

- Mapping of long term cost efficiency considerations to measures adopted.
- Methodology used for long term cost efficiency measures.
- Proposed future long term cost efficiency measures.

Long term cost efficiency – considerations and methodology

Table D1: Long term cost efficiency considerations and measures

Consideration	Measure Used
Relative considerations:	
The implied deficit recovery period.	**Deficit Period:** Implied deficit recovery period calculated on a standardised best estimate basis.
The investment return required to achieve full funding.	**Required Return:** The required investment return rates to achieve full funding in 20 years' time on a standardised best estimate basis.
The pace at which the deficit is expected to be paid off.	**Repayment Shortfall:** The difference between: actual contributions in excess of GAD's best estimate of future service cost and the annual deficit recovery contributions required as a percentage of payroll to pay off the deficit in 20 years, where the deficit is calculated on a standardised best estimate basis.
Absolute Considerations:	
The extent to which the required investment return set out above is less than the estimated future return being targeted by a fund's investment strategy.	**Return Scope:** The required investment return rates as calculated in required return, compared with the fund's expected best estimate future returns assuming current asset mix maintained.
The extent to which any deficit recovery plan can be reconciled with, and can be demonstrated to be a continuation of, the previous deficit recovery plan, after allowing for actual fund experience.	**Deficit Reconciliation:** Confirmation that the deficit period can be demonstrated to be a continuation of the previous deficit recovery plan, after allowing for actual fund experience.

D.2 For the 2023 section 13 report, GAD has adopted the same measures as those in 2020. As in 2020 a qualitative step was introduced to consider whether it was felt that the risk identified was potentially material to the fund.

D.3 The analyses and calculations carried out under these long term cost efficiency measures are approximate. They rely on the accuracy of the data provided by the respective local firms of actuarial advisors.

D.4 Although the calculations are approximate, we consider they are sufficient for the purposes of identifying which funds are a potential cause for concern. While the measures should not represent targets, these measures help us determine whether a more detailed review is required; for example, we would have greater concern where multiple measures triggered amber for a given fund.

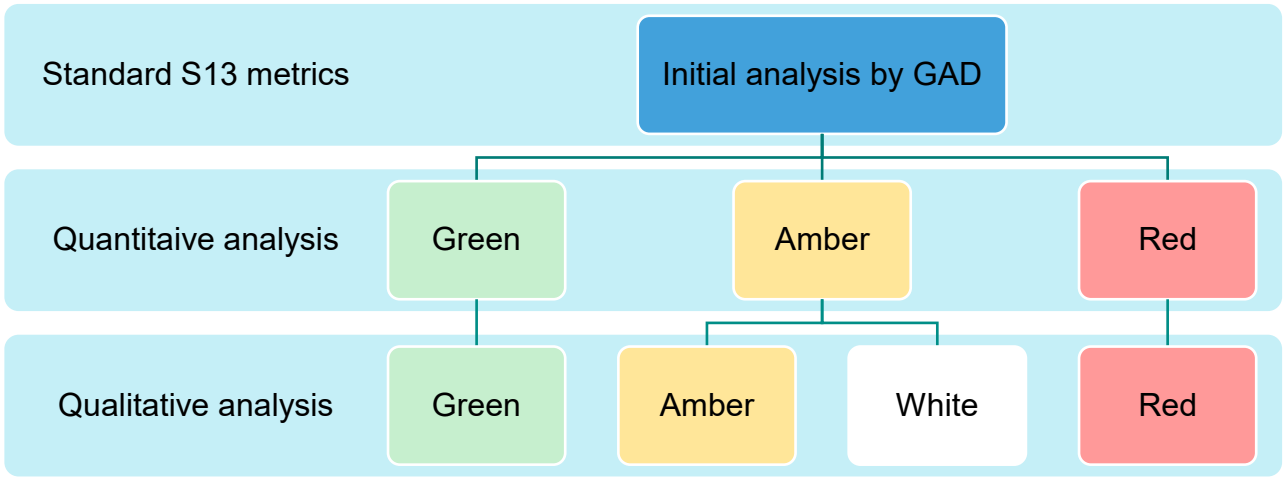
Long term cost efficiency measures – methodology

D.5 We detail the methodology behind the measures used to assess a fund's long term cost efficiency position below. The analysis is carried out a fund level, except where stated, but individual employers within any fund may be in a different position. Some of the measures listed below were calculated using a market consistent set of assumptions. For more information on this best estimate basis please see Appendix F.

D.6 The 2017 section 13 exercise developed the approach of setting Red, Amber or Green ('RAG') flags for the long term cost efficiency measure, where amber and red flags were raised when a fund breached thresholds set by GAD. For the 2020 and 2023 exercises, GAD initially adopted the same RAG approach and thresholds, however the flag allocation has been revised to concentrate on funds which raised multiple flags. GAD also introduced a subsequent qualitative step, which utilised the graph showing relative funding level relative and contributions, which assisted GAD in determining whether to flag and/or engage with a fund.

D.7 Following discussions with SPPA, GAD agreed that it is not helpful to focus on all individual fund flags but rather to concentrate on funds with multiple flags or those highlighted from consideration of the graph of relative funding level and contributions. This resulted in the introduction of a "white" flag at the 2020 exercise. The white flag is an advisory flag that highlights a general risk but does not require action in isolation.

D.8 The chart below illustrates the steps taken by GAD in determining the flag colours for the metrics.



D.9 The text box below defines each flag colour:

Key

RED indicates a material issue that may result in the aims of section 13 not being met. In such circumstances remedial action to ensure long term cost efficiency may be considered.

AMBER indicates a potential material issue that we would expect funds' to be aware of. In isolation this would not usually contribute to a recommendation for remedial action in order to ensure long term cost efficiency.

WHITE is an advisory flag that highlights a general issue but one which does not require an action in isolation. It may have been an amber flag if we had broader concerns.

GREEN indicates that there are no material issues that may contribute to a recommendation for remedial action in order to ensure long term cost efficiency.

D.10 GAD will assess the position again at the time of the 2026 section 13 report and will decide whether to retain the white flag, return to the RAG approach or use other metrics/thresholds that are appropriate for the circumstances of the LGPS Scotland at that point in time.

Deficit period: The implied deficit recovery period calculated on a standardised best estimate basis

D.11 This is a market related metric and calculations are carried out on a standardised best estimate basis.

D.12 The implied deficit recovery period in years on the standardised best estimate basis was found by solving the following equation for x:

D.13
$$\bar{a}_x = \frac{\text{Deficit on standardised BE basis}}{\text{Annual deficit recovery payment on standardised BE basis}}$$

Where:

- x is the implied deficit recovery period.
- $\bar{a}_x$ is a continuous annuity over x years at the rate of interest equal to $\frac{(1+i)}{(1+e)} - 1$.
- i is the nominal discount rate assumption on the standardised best estimate basis.
- e is the general earnings inflation assumption on the standardised best estimate basis.
- The deficit on the standardised best estimate basis is as at 31 March 2023.
- The Annual deficit recovery payment on the standardised best estimate basis is calculated as the difference between the average employer contribution rate for the years 2024/25 to 2026/27, allowing for both contributions paid as a percentage of salary and fixed monetary contributions into the fund, where deficit contributions are fixed (i.e. the fixed monetary contributions, if any, have been converted so that they are quoted as a percentage of salary roll), and the employer standard contribution rate on the standardised best estimate basis for

the years 2024/25 to 2026/27 (which is assumed to be equal to the employers' share of the future cost of accrual of that particular fund).

D.14 Funds that were in surplus or where the implied deficit recovery period was less than 10 years were flagged as green. Those with recovery periods greater than or equal to 10 years were flagged as amber. If there were any funds that were paying contributions at a level that would result in an increase in deficit, they would have been flagged as red.

D.15 As set out in the methodology section above, GAD undertook a subsequent qualitative analysis on whether initial amber flag colours should be revised to white.

Required return: The required investment return rates to achieve full funding in 20 years' time on the standardised best estimate basis

D.16 This is a market related metric and calculations are carried out on a standardised best estimate basis.

D.17 The following assumptions were made for the purposes of this calculations:

- Time 0 is 31 March 2023.
- Time 20 is 31 March 2043.
- A_0 is the value of the fund's assets at time 0 and was obtained from the data provided by the local firms of actuarial advisors.
- A_{20} is the projected value of the fund's assets at time 20 (using the equation below).
- L_0 is the value of the fund's liabilities at time 0, on a standardised best estimate basis.
- L_{20} is the projected value of the fund's liabilities at time 20 (using the equation below).
- C_0 is one year's employer contributions paid from time 0.
- C_{0-20} is the total employer contributions payable over the period time 0 – 20, assumed to occur mid-way between time 0 and time 20 (i.e. at time 10).
- B_0 is the value of one year's benefits paid (excluding transfers) from time 0.
- B_{0-20} is the total value of benefits payable (excluding transfers) over the period time 0 – 20, assumed to occur mid-way between time 0 and time 20 (i.e. at time 10).
- SCR_0 is the standard contribution rate payable from time 0 to time 1 on a standardised best estimate basis.
- SCR_{0-20} is the standard contribution rate payable from time 0 – 20, assumed to occur mid-way between time 0 and time 20 (i.e. at time 10).
- Sal_0 is the salary roll at time 0 and was obtained from the data provided by the local firms of actuarial advisors.
- i is the nominal discount rate assumption on the standardised best estimate basis.
- e is the general earnings assumption on the standardised best estimate basis.
- x is the required investment return that is to be calculated.

D.18 The membership profile is assumed to be constant.

D.19 The assets and liabilities at time 20 were then equated and the resulting quadratic equation solved to find the required rate of investment return to achieve full funding, i.e.:

$$A_{20} - L_{20} = 0$$

Where:

- $A_{20} = [A_0 \times (1+x)^{20}] + [(C_{0-20} - B_{0-20}) \times (1+x)^{10}]$
- $L_{20} = [L_0 \times (1+i)^{20}] + [(SCR_{0-20} - B_{0-20}) \times (1+i)^{10}]$
- $C_{0-20} = C_0 \times 20 \times (1+e)^{10}$
- $B_{0-20} = B_0 \times 20 \times (1+e)^{10}$
- $SCR_{0-20} = Sal_0 \times SCR_0 \times 20 \times (1+e)^{10}$

D.20 Where the required investment return was higher than the nominal discount rate on the standardised best estimate basis (i.e. i where i = 5.60%) funds would be classified as amber, whereas funds were classified as green if the required return was less than 5.60%.

D.21 As set out in the methodology section above, GAD undertook a subsequent qualitative analysis on whether initial amber flag colours should be revised to white.

Repayment shortfall: The difference between the actual contribution rate net of GAD's best estimate future service cost and the annual deficit recovery contributions (on a standardised best estimate basis and assuming deficit is paid off in 20 years), as a percentage of payroll

D.22 This is a market related metric and calculations are carried out on a standardised best estimate basis.

D.23 For this calculation we determine the difference between:

- The employer contributions in excess of GAD's best estimate future service cost, and
- The required annual deficit recovery contribution rate on a standardised best estimate basis to pay off the deficit in 20 years' time.

D.24 The required annual deficit recovery contribution rate to be paid on a standardised best estimate basis is equal to:

$$\frac{\text{Deficit on standardised best estimate basis}}{\ddot{a}_{\mathbf{20}} \times \text{ Salary Roll}}$$

Where:

- The deficit on the standardised best estimate basis is as at 31 March 2023.
- $\ddot{a}_{20}$ is a continuous annuity over the 20 year deficit recovery period at the rate of interest equal to $\frac{(1+i)}{(1+e)} - 1$.
- i is the nominal discount rate assumption on the standardised best estimate basis.

- e is the general earnings inflation assumption on the standardised best estimate basis.
- The salary roll is as at 31 March 2023 and has not been adjusted.

D.25 The difference in deficit recovery contribution rates is then defined as:

$$(\text{Avg ER cont rate paid} - \text{ER SCR on BE basis}) - \frac{\text{Deficit on BE basis}}{\ddot{a}_{20} \text{ x Salary Roll}}$$

Where:

- The average employer contribution rate is for the years 2024/25 – 2026/27, allowing for both contributions paid as a percentage of salary and fixed monetary contributions into the fund where deficit contributions are fixed (i.e. the fixed monetary contributions, if any, have been converted so that they are quoted as a percentage of salary roll).
- The employer standard contribution rate on the standardised best estimate basis is for the years 2024/25 – 2026/27. It is assumed that the standard contribution rate is equal to the employers' share of the future cost of accrual of that particular fund.

D.26 The data required for each of the funds to carry out the above calculation was provided by their respective firms of actuarial advisors.

D.27 Where appropriate, data has been restated on the standardised best estimate basis.

D.28 Funds in surplus on GAD's best estimate basis or where the difference in deficit recovery contribution rates is greater than 0% are flagged as green. Where the difference between contribution rates is between 0% and -3%, the funds would be flagged as amber and if the difference in deficit recovery contribution rates is less than -3%, then the fund would be flagged as red.

D.29 As set out in the methodology section above, GAD undertook a subsequent qualitative analysis on whether initial amber flag colours should be revised to white.

Return scope: The required investment return rates as calculated in required return, compared with the fund's expected best estimate future returns assuming current asset mix maintained

D.30 This is a market related metric and calculations are done on a standardised best estimate basis.

D.31 The required investment return (x) calculated in the required return measure was compared against the best estimate investment return expected from the fund's assets held on 31 March 2023.

D.32 The asset data used in this calculation was provided by each fund's respective firm of actuarial advisors.

D.33 Funds where the best estimate future returns were higher than the required investment return by 0.5% or more were flagged as green. Those funds where this difference was between 0% and 0.5% would be flagged as amber whilst those where the best estimate returns were lower than the required investment returns were flagged as red.

D.34 As set out in the methodology section above, GAD undertook a subsequent qualitative analysis on whether initial amber flag colours should be revised to white.

Deficit reconciliation: Confirmation that the deficit period can be demonstrated to be a continuation of the previous deficit recovery plan, after allowing for actual fund experience

D.35 This measure is used to monitor the change in the deficit recovery end point set locally by the fund at each valuation and what the underlying reasons are for any adverse changes in this period.

D.36 This measure considers the following:

- Whether contributions have decreased since the previous valuations (reducing the burden on current tax payers).
- Whether the deficit recovery end point has moved further into the future, compared with the previous valuation (increasing the burden on future tax payers).

D.37 Funds where both of the above have occurred are initially flagged amber otherwise funds are flagged green. A subsequent qualitative assessment considered whether the flag was affected by new deficit emerging over the inter-valuation period or by considered funding decisions at either the previous or current valuations.

Long term cost efficiency measures – proposed future metrics

D.38 GAD propose introducing two new metrics to consider if funds are:

a. Utilising surpluses too quickly.

b. Retaining "large" surpluses.

Surplus retention: contributions from funds in surplus could lead to too great a funding risk in the future (utilising surpluses too quickly)

D.39 The fund would need to pay sufficient contributions after allowing for future costs of accrual, such that either:

$$\text{Avg ER cont rate paid} - \text{ER SCR on GAD's best estimate basis} > 0$$

Or where:

$$\text{Avg ER cont rate paid} - \text{ER SCR on GAD's best estimate basis} < 0$$

The implied surplus spreading period on GAD's best estimate basis was found by solving the following equation for x:

$$\bar{a}_x = \frac{\text{Surplus on GAD's best estimate basis}}{\text{Annual deduction to GAD's best estimate ER SCR}}$$

Where:

- x is the implied surplus spreading period.
- $\bar{a}_x$ is a continuous annuity over x years at the rate of interest equal to $\frac{(1+i)}{(1+e)} - 1$.
- i is the nominal discount rate assumption on the standardised best estimate basis.
- e is the general earnings inflation assumption on the standardised best estimate basis.

- The surplus on the standardised best estimate basis is as at 31 March 2023.
- The Annual deduction to GAD's best estimate ER SCR is calculated as the difference between the average employer contribution rate for the years 2024/25 to 2026/27, allowing for both contributions paid as a percentage of salary and fixed monetary contributions into the fund, where contribution reductions are fixed (i.e. the fixed monetary contributions, if any, have been converted so that they are quoted as a percentage of salary roll), and the employer standard contribution rate on the standardised best estimate basis for the years 2024/25 to 2026/27 (which is assumed to be equal to the employers' share of the future cost of accrual of that particular fund).
- The average employer contribution rate is for the years 2024/25 – 2026/27, allowing for both contributions paid as a percentage of salary and fixed monetary contributions into the fund where deficit contributions are fixed (that is, the fixed monetary contributions, if any, have been converted so that they are quoted as a percentage of salary roll).
- The employer standard contribution rate on the best estimate basis is for the 2024/25 – 2026/27. It is assumed that the standard contribution rate is equal to the employers' share of the future cost of accrual of that fund.

D.40 Funds flag green where:

- the difference in contribution is greater than zero; or
- the difference in contributions is less than zero and the implied surplus spreading is greater than 10 years.

Otherwise, the funds are flagged amber.

Surplus retention: proposed approach to consider if funds are retaining too much surplus

D.41 GAD will adopt a three-step approach:

1. Identify the highest funded funds, considering both the local bases and on a standard basis.
2. Identify those funds which are relatively well funded, on the local and standard basis, and are also paying relatively high contributions.
3. For those funds identified in steps one to two, we would undertake qualitative analysis, for example considering how contribution rates have evolved since the previous valuation and any stated rationale behind the approach adopted.

D.42 Steps one to three aim to identify funds which are exceptionally well funded, or those which are relatively well funded and paying relatively high contributions. We propose considering results on two bases, initially using the SAB funding level to provide a consistent basis. However, as this is not a funding basis we will also consider the position on the local funding basis. The funds identified in steps one to three will not raise an immediate flag as we also wish to consider any other relevant circumstances and the decision-making process.

D.43 We would then engage with any funds identified from this process to discuss any concerns before deciding which funds to flag.

D.44 We would also look to identify any funds with surplus calculations that are non-standard, or those where particular groups of employers may have concerns about their surplus calculations.

Fund analysis as at 31 March 2023

D.45 Table 7.2 of the main report showed funding levels, secondary contribution rates, stabilisation approaches, and best-estimate probabilities of funding success, for each of the LGPS Scotland funds. Table D2, below, shows an equivalent analysis, but showing total contribution rates, rather than secondary contribution rates.

Table D2: Funding levels and setting total employer contribution rates

Pension fund	2023 local funding level	2020 local funding level	Total cont. rate 24/25 (2023 val)	Total cont. rate 25/26 (2023 val)	Total cont. rate 26/27 (2023 val)	Stabilisation used in 2023	Total cont. rate 23/24 (2020 val)	Probability of success
Dumfries and Galloway Council Pension Fund	122%	92%	20.9%	19.9%	19.0%	Stability mechanism	22.3%	92%
Falkirk Council Pension Fund	137%	94%	19.1%	19.1%	19.1%	Stability mechanism	22.8%	94%
Fife Pension Fund	151%	97%	21.3%	21.3%	21.3%	Stability mechanism	24.7%	94%
Lothian Pension Fund	157%	106%	17.5%	17.5%	17.5%	Stability mechanism	21.8%	95%
North East Scotland Pension Fund	126%	103%	14.0%	14.0%	14.0%	115% surplus buffer	19.1%	N/A
Orkney Islands Council Pension Fund	164%	118%	15.0%	15.0%	15.0%	Stability mechanism	17.0%	95%
Scottish Borders Pension Fund	134%	110%	16.9%	16.9%	16.9%	Stability mechanism	18.6%	95%
Shetland Islands Council Pension Fund	120%	92%	19.5%	19.5%	19.5%	None	22.6%	88%
Strathclyde Pension Fund	147%	106%	6.8%	6.7%	17.1%	None	19.6%	94%
Tayside Pension Fund	110%	109%	15.8%	15.7%	15.7%	10% volatility asset reserve	17.0%	N/A
The Highland Council Pension Fund	136%	100%	17.5%	17.5%	17.5%	Stability mechanism	19.3%	93%

Appendix E: Data Provided

E.1 At the request of SPPA, GAD collected data from each fund's 2023 valuation via the fund actuaries. These actuarial funding valuations were conducted by three firms of actuarial advisors:

- Barnett Waddingham
- Hymans Robertson
- Mercer

E.2 Data was received from the relevant firm of actuarial advisors for all twelve pension funds and included additional information provided to the fund actuaries by administrators in respect of their fund's employers.

E.3 Limited checks, consisting of spot checks to make sure that data entries appear sensible, have been performed by GAD and the data received appears to be of sufficient quality for the purpose of analysing the 2023 valuation results. These checks do not represent a full, independent audit of the data supplied. The analysis contained in this report relies on the general completeness and accuracy of the information supplied by the administering authority or their firms of actuarial advisors.

E.4 In addition, GAD has received individual membership data from each of the funds as part of the 2020 scheme valuation. This data has been used in GAD's best estimate.

E.5 Unless otherwise stated, the data detailed above has been used to inform the analysis contained in the LGPS Scotland section 13 2023 report.

E.6 The information provided to GAD is, in many instances, more detailed than that provided in the actuarial valuation reports.

Data specification

1) Membership Data

Data split by gender	
a) Active Members	Number of Members Unweighted average age (to 2dp) Total rate of annual actual pensionable pay at 31 March 2023 and 31 March 2020 (2015 pay definition)
b) Deferred Member	Number of members Unweighted average age (to 2dp) Total annual preserved pension revalued to 31 March 2023 for both 31 March 2023 and 31 March 2020. Note this should exclude undecided members.
c) Pensioners (former members)	Number of Members Unweighted average age (to 2dp) Total annual pensions in payment at 31 March 2023 and 31 March 2020
d) Pensioners (dependants including partners and children)	Number of Members Average age (weighted as appropriate) Total annual pensions in payment at 31 March 2023 and 31 March 2020

2) Financial Assumptions

Assumptions used to value the liabilities of the most secure employers (e.g. local authorities)	
a) Specify what proportion of the liabilities is calculated using the assumptions below	
b) Provide assumptions used for past service liabilities, these have been given for both as at 31 March 2023 and 31 March 2020.	Nominal discount rate (pre & post retirement separately if applicable) RPI inflation CPI inflation rate Earnings inflation
c) Provide assumptions used for future contributions, these have been given for both as at 31 March 2023 and 31 March 2020.	Nominal discount rate (pre & post retirement separately if applicable) RPI inflation CPI inflation rate Earnings inflation
d) Short term assumptions used in the valuation (if applicable)	CPI Salary Increases Discount Rate
e) Maximum deficit recovery period	
f) Minimum surplus spreading period	
g) Likelihood of success of valuation funding plan on the previous valuation time horizon (where a fund is in deficit at the valuation date)	

3) Demographic Assumptions

Rates to be provided at sample ages split by gender Each could be split further in Group 1, Group 2, Group 3, Group 4, and Group 5	
a) Assumed life expectancy for members retiring in normal health	Pensioner members aged 65 (for members retiring on normal health) (to 2dp) (with mortality improvements) Pensioner members aged 65 (for members retiring on normal health) (to 2dp) (without mortality improvements) Active / deferred members at age 65 if they are currently aged 45 (to 2dp) (with mortality improvements) Active / deferred members at age 65 if they are currently aged 45 (to 2dp) (without mortality improvements)
b) Commutation	Pre 2008 pension Commutation Assumptions (as % of maximum lump sum allowed under HMRC rules). Post 2008 pension Commutation Assumptions (as % of maximum lump sum allowed under HMRC rules).

4) ASSETS

These are split to provide information for 31 March 2023 and 31 March 2020		
a) Market value of assets		
b) Value of assets used in the valuation		
c) Do you use a smoothed asset value in the valuation? If yes, please attach an explanation		
d) Were there any “asset transfer” arrangements, for local authorities? If so, please include		
e) Actual Asset Distribution split into the following:	Proportion of assets held in Bonds	Proportion of bonds which are fixed interest government bonds
		Proportion of bonds which are fixed interest non-government bonds (investment grade)
		Proportion of bonds which are fixed interest non-government bonds (high yield)
		Proportion of bonds which are inflation linked bonds
	Proportion of assets held in Equities	Proportion of equities which are UK equities
		Proportion of equities which are overseas equities
		Proportion of equities which are unquoted or private equities
	Proportion of assets held in Property	
	Proportion of assets held in Deferred or immediate fully insured annuities	
	Proportion of assets held in Hedge funds	
	Proportion of assets held in Cash and net current assets	
	Proportion of assets held in ABC arrangements	

	Proportion of assets held in Infrastructure – debt type
	Proportion of assets held in Infrastructure* – equity type
	Proportion of assets held in Multi asset funds (examples include diversified growth funds, managed funds, balanced funds, multi asset credit or absolute returns)
	Proportion of assets held in "Other" investments – defensive
	Proportion of assets held in "Other" investments – return seeking
f) Weighted best estimate return	
g) Strategic asset distribution (if significantly different to actual asset distribution)	Proportion of assets held in: Bonds Equities Property Infrastructure Cash and current assets Other investments – defensive Other investments – return seeking
h) Weighted best estimate return (strategic asset distribution)	

5) LIABILITIES AND FUTURE CONTRIBUTION RATE

These are split to provide information for 31 March 2023 and 31 March 2020	
i) Local Assumptions	a) Past service liability – split between Actives, Deferred, Pensioners and Total
	b) Funding level
	c) Surplus / deficit
	d) Assumed member contribution yield
	e) Total employer contributions paid in respect of 2023/24
	f) Other notable events that have occurred in respect of 2023/24
	g) Other notable Post valuation events that have been considered as part of the 2023 valuation (including asset transfer or large contributions not covered in 4d)
ii) SAB Standardised Basis	a) Past service liability – split between Actives, Deferred, Pensioners and Total
	b) Funding level
	c) Surplus / deficit
	d) SAB future service costs (excluding expenses) %

6) EMERGING ISSUES

a) Is there a comment in your report that climate change is implicitly included in the funding basis	
b) Is climate change acknowledged in your FSS	
c) The next section is split for 4 distinct climate scenarios, Base case, Paris scenario, High temperature scenario, Alternative scenario (if applicable)	Funding level at 31 March 2043 Success percentage at 31 March 2043 Nominal discount rate, pre and post retirement RPI inflation CPI inflation rate Earnings inflation Change in assumptions volatility
d) General allowances made for COVID-19 in 2023 valuation.	

7) Post 2015 scheme

a) Assumption for members in 50/50 scheme (if a proportion of members include details in 7b below)
b) Proportion of members assumed to be in 50/50 scheme

8) Documentation required

Valuation Report @ 31 March 2023
Relevant related reports
Compliance Extract
Statement of Investment Strategy
Funding Strategy Statement
Other

ALTERNATIVE FINANCIAL ASSUMPTIONS

Specify where a significant proportion of employer liabilities have been valued using alternative assumptions – provided as above in section (2) above.

Appendix F: Assumptions & Method

F.1 Each piece of analysis contained in the main report is based on one of three sets of assumptions:

- The local fund assumptions, as used in the fund's 2023 actuarial valuation.
- The SAB standardised set of assumptions, or SAB standard basis: this is used as a comparator between funds but is not market related.
- A best estimate set of assumptions: this is a standardised market consistent basis which is used to assess potential impacts to solvency and long term cost efficiency.

F.2 Details of local fund assumptions can be found in each fund's actuarial valuation report as at 31 March 2023. Details of the SAB standard basis and the standardised best estimate basis can be found in the table below.

Table F1: SAB standard basis and best estimate basis

Assumption	SAB standard basis	Best Estimate basis
Methodology	Projected Unit Methodology with 1 year control period	Projected Unit Methodology with 1 year control period
Rate of pension increases	2% per annum	2.4% per annum
Public sector earnings growth	3.5% per annum	3.9% per annum
Discount rate	4.45% per annum	5.6% per annum
Changes to State Pension Age (SPA)	As legislated	As legislated
Pensioner Baseline mortality	Set locally based on Fund experience	Set locally based on Fund experience
Mortality improvements	Core CMI_2021 (no allowance for 2020 and 2021 mortality data) with long term reduction in mortality rates of 1.5% per annum	Improvements in line with those underlying the ONS 2020-based principal population projections for the UK
Age retirement	Set locally based on Fund experience	Set locally based on Fund experience
Ill health retirement rates	Set locally based on Fund experience	Set locally based on Fund experience
Withdrawal rates	Set locally based on Fund experience	Set locally based on Fund experience
Death before retirement rates	Set locally based on Fund experience	Set locally based on Fund experience
Promotional salary scales	None	As set out in GAD's 2020 valuation
Commutation	SAB future service cost assumption of 65% of the maximum allowable amount	As set out in GAD's 2020 valuation

Assumption	SAB standard basis	Best Estimate basis
Family statistics	Set locally based on Fund experience	Set locally based on Fund experience

F.3 The financial assumptions for the best estimate basis are based on GAD's neutral assumptions for long term inflation measures and asset returns, and the split of LGPS Scotland assets held, as at 31 March 2023. These neutral assumptions are not deliberately optimistic nor pessimistic and do not incorporate adjustments to reflect any desired outcome. We believe there is around a 50% chance of outcomes being better and a 50% chance of outcomes being worse than these assumptions imply, based on market conditions as at 31 March 2023.

F.4 Future asset returns are uncertain and there is a wide range of reasonable views on what future asset returns will be and therefore the best estimate discount rate should be. We have presented GAD's neutral view above, but there are other reasonable best estimate bases which may give materially different results.

F.5 The fund actuaries have provided details of liabilities at the valuation date, for each fund, on both local and SAB standard bases. We have used these liabilities in our metrics as appropriate. Where we have used the GAD best-estimate basis in metrics, we have estimated the liabilities on that basis through the use of 'basis switch' calculations which allow us to measure the impact of the relevant changes in the assumptions.

F.6 The 'basis switch' we have carried out has been calculated using individual membership data provided to us for our valuation of the scheme as at 31 March 2020, as outlined in our valuation data report. We have then rolled-forward the liabilities to the valuation date using cashflow data provided by the fund. This is a different approach than for our S13 valuation of the 2020 valuations, where we held membership data at the valuation date and so no roll-forward was required.

Appendix G: Section 13 of the Public Service Pensions Act 2013

13 Employer contributions in funded schemes

(1) This section applies in relation to a scheme under section 1 which is a defined benefits scheme with a pension fund.

(2) Scheme regulations must provide for the rate of employer contributions to be set at an appropriate level to ensure

(a) the solvency of the pension fund, and

(b) the long term cost efficiency of the scheme, so far as relating to the pension fund.

(3) For that purpose, scheme regulations must require actuarial valuations of the pension fund.

(4) Where an actuarial valuation under subsection (3) has taken place, a person appointed by the responsible authority is to report on whether the following aims are achieved

(a) the valuation is in accordance with the scheme regulations

(b) the valuation has been carried out in a way which is not inconsistent with other valuations under subsection (3)

(c) the rate of employer contributions is set as specified in subsection (2).

(5) A report under subsection (4) must be published and a copy must be sent to the scheme manager and (if different) the responsible authority.

(6) If a report under subsection (4) states that, in the view of the person making the report, any of the aims in that subsection has not been achieved

(a) the report may recommend remedial steps

(b) the scheme manager must

i. take such remedial steps as the scheme manager considers appropriate, and

ii. publish details of those steps and the reasons for taking them

(c) the responsible authority may

i. require the scheme manager to report on progress in taking remedial steps

ii. direct the scheme manager to take such remedial steps as the responsible authority considers appropriate.

(7) The person appointed under subsection (4) must, in the view of the responsible authority, be appropriately qualified.

The section of the legislation can be viewed on legislation.gov.uk, Public Service Pensions Act 2013

Appendix H: Extracts from other relevant regulations

Regulations 56 and 60 of 'The Local Government Pension Scheme (Scotland) Regulations 2018'

Funding strategy statement (Regulation 56)

(1) An administering authority must, after consultation with such persons as it considers appropriate, prepare, maintain and publish a written statement setting out its funding strategy.

(2) The statement must be published no later than 31st March 2016.

(3) The authority must keep the statement under review and, after consultation with such persons as it considers appropriate, make such revisions as are appropriate following a material change in its policy set out in the statement, and if revisions are made, publish the statement as revised.

(4) In preparing, maintaining and reviewing the statement, the administering authority must have regard to

(a) the guidance set out in the document published in October 2012 by CIPFA, the Chartered Institute of Public Finance and Accountancy and called "Preparing and Maintaining a Funding Strategy Statement in the Local Government Pension Scheme 2012" and

(b) the current version of the investment strategy under regulation 12 (investment strategy statement) of the Local Government Pension Scheme (Management and Investment of Funds) (Scotland) Regulations 2010.

Actuarial valuations of pension funds (Regulation 60)

(1) An administering authority must obtain

(a) an actuarial valuation of the assets and liabilities of each of its pension funds as at 31st March 2020 and on 31st March in every third year afterwards

(b) a report by an actuary in respect of the valuation, and

(c) a rates and adjustments certificate prepared by an actuary.

(2) Each of those documents must be obtained before the first anniversary of the date ("the valuation date") as at which the valuation is made or such later date as the Secretary of State may agree.

(3) A report under paragraph (1)(b) must contain a statement of the demographic assumptions used in making the valuation and the statement must show how the assumptions relate to the events which have actually occurred in relation to members of the Scheme since the last valuation.

(4) A rates and adjustments certificate is a certificate specifying

(a) the primary rate of the employer's contribution and

(b) the secondary rate of the employer's contribution,

for each year of the period of three years beginning with 1st April in the year following that in which the valuation date falls.

(5) The primary rate of an employer's contribution is the amount in respect of the cost of future accruals which, in the actuary's opinion, should be paid to a fund by all bodies whose employees contribute to it so as to secure its solvency, expressed as a percentage of the pay of their employees who are active members.

(6) The actuary must have regard to-

(a) the existing and prospective liabilities arising from circumstances common to all those bodies

(b) the desirability of maintaining as nearly constant a primary rate as possible

(c) the current version of the administering authority's funding strategy mentioned in regulation 56 (funding strategy statements) and

(d) the requirement to secure the solvency of the pension fund and the long term cost efficiency of the Scheme, so far as relating to the pension fund.

(7) The administering authority must provide the actuary preparing a valuation or a rates and adjustments certificate with the consolidated revenue account of the fund and such other information as the actuary requests.

(8) In this regulation:

(a) the primary rate of an employer's contribution is the amount in respect of the cost of future accruals which, in the actuary's opinion, should be paid to a fund by all bodies whose employees contribute to it so as to secure its solvency, expressed as a percentage of the pay of their employees who are active members; and

(b) the secondary rate of an employer's contributions is any percentage or amount by which, in the actuary's opinion, contributions at the primary rate should, in the case of a Scheme employer, be increased or reduced by reason of any circumstances peculiar to that employer.

Appendix I: Allocation of Scottish local authorities to LGPS Scotland administering authorities

Scottish local government consists of 31 local authorities. These participate in the LGPS Scotland through eleven administering authorities. The local authorities are allocated across these administering authorities as shown below.

LGPS Administering Authorities, funds and allocation of local authorities

Glasgow City Council

Strathclyde Pension Fund
Glasgow City Council
Argyle and Bute Council
East Ayrshire Council
North Ayrshire Council
South Ayrshire Council
West Dunbartonshire Council
East Dunbartonshire Council
North Lanarkshire Council
South Lanarkshire Council
East Renfrewshire Council
Renfrewshire Council
Inverclyde Council

City of Edinburgh Council

Lothian Pension Fund
City of Edinburgh Council
Midlothian Council
West Lothian Council
East Lothian Council

Aberdeen City Council

North East Scotland Pension Fund
Aberdeen City Council
Aberdeenshire Council
Moray Council

Dundee City Council

Tayside Pension Fund
Dundee City Council
Angus Council
Perth and Kinross Council

Scottish Borders Council

Scottish Borders Pension Fund
Scottish Borders Council

Dumfries & Galloway Council

Dumfries and Galloway Pension Fund
Dumfries and Galloway Council

Falkirk Council

Falkirk Council Pension Fund
Falkirk Council
Stirling Council
Clackmannanshire Council

Fife Council

Fife Pension Fund
Fife Council

Highland Council

The Highland Pension Fund
The Highland Council

Shetland Islands Council

Shetland Islands Pension Fund
Shetland Islands Council

Orkney Islands Council

Orkney Islands Pension Fund
Orkney Islands Council