Government Actuary's Department

LGPS ENGLAND AND WALES

Appendices to Section 13 Dry Run Report

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Appendix A: Section 13 of the Public Service Pensions Act 2013[1]

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.

[1] http://www.legislation.gov.uk/ukpga/2013/25/section/13

Appendix B: Extracts from other relevant regulations

Regulations 35 and 36 from 'The Local Government Pension Scheme (Administration) Regulations 2008[2]'

Funding strategy statement

35.–(1) This regulation applies to the funding strategy statement prepared and published by an administering authority under regulation 76A of the 1997 Regulations[3].

(2) The authority must—

(a) keep the statement under review;

(b) make such revisions as are appropriate following a material change—

(i) in its policy on the matters set out in the statement, or

(ii) to the current version of its statement under regulation 9A of the Local Government Pension Scheme (Management and Investment of Funds) Regulations 1998 (statement of investment principles); and

(c) if revisions are made, publish the statement as revised.

(3) In reviewing and making revisions to the statement, the authority must—

(a) have regard to the guidance set out in the document published in March 2004 by CIPFA and called "CIPFA Pensions Panel Guidance on Preparing and Maintaining a Funding Strategy Statement (Guidance note issue No.6)"; and

(b) consult such persons as it considers appropriate.

Actuarial valuations and certificates

36.–(1) Each administering authority must obtain—

(a) an actuarial valuation of the assets and liabilities of each of its pension funds as at 31st March 2010 and 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.

[2] http://www.legislation.gov.uk/uksi/2008/239/contents/made

[3] Regulation 76A was inserted by The Local Government Pension Scheme (Amendment) Regulations 2004

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

(a) the common rate of employer's contribution; and

(b) any individual adjustments,

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 common rate of employer's contribution is the amount which, in the actuary's opinion, should be paid to the 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 of the fund arising from circumstances common to all those bodies;

(b) the desirability of maintaining as nearly constant a common rate as possible; and

(c) the current version of the administering authority's funding strategy statement mentioned in regulation 35.

(7) An individual adjustment is any percentage or amount by which, in the actuary's opinion, contributions at the common rate should, in the case of a particular body, be increased or reduced by reason of any circumstances peculiar to that body.

(8) A 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 provisions of the Scheme; and

(b) the amount of the liabilities arising in respect of such members,

during the period covered by the certificate.

(9) The 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 he requests.

Regulation 12 of 'The Local Government Pension Scheme (Management and Investment of Funds) Regulations 2009[4]'

Statement of investment principles

12.–(1) An administering authority must, after consultation with such persons as it considers appropriate, prepare, maintain (in accordance with paragraph (5)) and publish a written statement of the principles governing its decisions about the investment of fund money.

(2) The statement must cover its policy on—

(a) the types of investment to be held;

(b) the balance between different types of investments;

(c) risk, including the ways in which risks are to be measured and managed;

(d) the expected return on investments;

(e) the realisation of investments;

(f) the extent (if at all) to which social, environmental or ethical considerations are taken into account in the selection, retention and realisation of investments;

(g) the exercise of the rights (including voting rights) attaching to investments, if the authority has any such policy; and

(h) stock lending.

(3) The statement must also state the extent to which the administering authority complies with guidance given by the Secretary of State, and, to the extent the authority does not so comply, the reasons for not complying.

(4) The first such statement must be published no later than 1st July 2010.

(5) The statement must be reviewed, and if necessary, revised, by the administering authority from time to time and, in the case of any material change in the authority's policy on the matters referred to in paragraphs (2) and (3), before the end of a period of six months beginning with the date of that change.

(6) A statement revised under paragraph (5) must be published.

[4] http://www.legislation.gov.uk/uksi/2009/3093/regulation/12/made

Regulations 58 and 62 of 'The Local Government Pension Scheme Regulations 2013[5]'

Funding strategy statement

58.–(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 2015.

(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 March 2004 by CIPFA, the Chartered Institute of Public Finance and Accountancy and called "CIPFA Pensions Panel Guidance on Preparing and Maintaining a Funding Strategy Statement (Guidance note issue No. 6)[6]"; and

(b) the statement of investment principles published by the administering authority under regulation 12 of the Local Government Pension Scheme (Management and Investment of Funds) Regulations 2009.

Actuarial valuations of pension funds

62.–(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 2016 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—

[5] http://www.legislation.gov.uk/uksi/2013/2356/contents/made

[6] ISBN Number 085299 996 8; copies may be obtained from CIPFA at 3 Robert Street, London, WC2N 6RL

(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 common rate as possible;

(c) the current version of the administering authority's funding strategy mentioned in regulation 58 (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 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.

(8) A 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.

(9) 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.

Appendix C: Data provided

C.1 At the request of the Department for Communities and Local Government ('DCLG') the Government Actuary's Department ('GAD') has collected data from each fund's 2013 valuation report. These actuarial funding valuations were conducted by four actuarial firms:

- Aon Hewitt
- Barnett Waddingham
- Hymans Robertson
- Mercer

C.2 Data were received from the relevant local actuary or the administering authority for 89 of the 91 pension funds. Information for the Environment Agency Closed Fund and South Yorkshire Passenger Transport Authority Pension Fund have been taken directly from their respective 2013 valuation reports by GAD.

C.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 2013 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 actuaries.

C.4 In addition, data has been collated from the '*Local government pension scheme funds local authority data*', which is published annually by DCLG. This published data may be referred to elsewhere as SF3 statistics.

C.5 Unless otherwise stated the data detailed above has been used to inform the analysis contained in the LGPS England and Wales Section 13 Dry Run Report.

C.6 The original data request sent to individual funds for the collection of 2013 valuation data and accompanying explanatory notes now follow.

Data specification

1) MEMBERSHIP DATA
   Data split by gender.

   a) Active members: number, average age (weighted as appropriate), average period of membership, total rate of annual actual pensionable pay at 31 March 2013, total rate of annual FTE pensionable pay at 31 March 2013,
   b) Deferred members: number, average age (weighted as appropriate), total annual preserved pension revalued to 31 March 2013. Note this should exclude undecided members.
   c) Pensioners (former members): number, average age (weighted as appropriate), total annual pensions in payment at 31 March
   d) Pensioners (dependants including partners and children): number, average age (weighted as appropriate), total annual pensions in payment at 31 March
   e) Pensionable pay definition, has the 2008 or 2014 definition been used to assess pensionable pay

2) FINANCIAL ASSUMPTIONS
   Provide separately for past service liabilities and future contributions, if different assumptions adopted. If different assumptions are adopted for Scheduled bodies and Admitted bodies the assumptions adopted for Scheduled bodies should be entered.

   a) Nominal discount rate (pre & post retirement separately if applicable)
   b) RPI inflation
   c) CPI inflation rate
   d) Earnings inflation

3) DEMOGRAPHIC ASSUMPTIONS
   Rates to be provided at sample ages split by gender

   a) Age Retirement Assumptions (split between members with and without Rule of 85 protection)
   b) Rates of Ill-health Retirement from Active service
   c) Distribution of ill health retirements between tiers 1, 2 and 3
   d) Rates of Withdrawal from Active service
   e) Death in Service Rates
   f) Promotional Salary Scale (if not included in earnings inflation assumption)
   g) Proportions Partnered
   h) Age disparity between Member & Partner
   i) Commutation Assumptions
   j) Assumed life expectancy for pensioner members aged 65 and active / deferred members at age 65 if they are currently aged 45 (for members retiring on normal health, members retiring on ill health and dependents)
   k) Description of post retirement mortality assumption (baseline and future improvements)

4) ASSETS
   a) Value of Assets (market value)
   b) Actual Asset Distribution (split by UK equities, overseas equities, corporate bonds, gilts, property, cash and other investments).

5) LIABILITIES AND FUTURE CONTRIBUTION RATE
   a) Common contribution rate
   b) Standard Contribution Rate
   c) Contribution rate in respect of surplus or deficit
   d) Assumed member contribution yield
   e) Expenses, split by administration and (if not included implicitly in discount rate) investment

f) Past Service Liability – split between Actives, Deferred and Pensioners
g) Funding Level
h) Surplus / Deficit at valuation date
i) Deficit Recovery Period
j) Past Service Liability (on a low risk / gilts basis) – split between Actives, Deferred and Pensioners

6) REVENUE ACCOUNTS
   a) Value of assets at last valuation (after any smoothing or other adjustments)
   b) Value of assets at this valuation (after any smoothing or other adjustments)
   c) Total Income: Employee contributions, normal employer contributions, special employer contributions, transfers in, investment income, other income
   d) Total Expenditure: Pensions paid, retirement lump sums paid, other lump sums paid, transfers out, investment expenses, administration expenses, other outgoings

7) ANALYSIS OF SURPLUS (PAST SERVICE LIABILITY)
   a) Surplus / Deficit at last valuation
   b) Interest on Surplus/Deficit
   c) Difference between contribution paid and cost of benefits accrued
   d) Experience gains and losses (including amounts in the following categories where analysed: Investment Return experience, Salary Increase experience, Pension Increase experience, Pensioner Mortality experience, Other Demographic experience)
   e) Change in assumptions (including amounts in the following categories where analysed: financial assumptions, mortality assumptions, other demographic assumptions)
   f) Other
   g) Surplus / Deficit at this valuation

8) ANALYSIS OF CHANGE IN FUTURE SERVICE CONTRIBUTION RATE
   a) Future service rate at last valuation
   b) Effect of change in assumptions (including amounts in the following categories where analysed: financial assumptions, mortality assumptions, other demographic assumptions)
   c) Change due to introduction new benefit design from April 2014
   d) Other
   e) Future service rate at this valuation (common contribution rate)

9) AVERAGE EMPLOYER CONTRIBUTION RATE
   a) Average employer contribution rate 2014/15, allowing for both contributions paid as a percentage of salary and fixed monetary contributions (where deficit contributions are fixed)

10) EXPERIENCE OVER THE INTERVALUATION PERIOD
    Please only provide data that is readily available

    a) Actual and expected numbers of deaths in service
    b) Actual and expected numbers of withdrawals
    c) Actual and expected numbers of age retirements
    d) Actual and expected numbers of ill-health retirements
    e) Actual and expected pensioner deaths (by lives and amount of pension).
    f) Actual and expected numbers of severance / redundancy
    g) Actual and assumed amount of commuted lump sum

11) POST 2014 SCHEME

    a) Proportion of members assumed to be in 50/50 scheme
    b) State Pension Ages used for assessment

Explanatory notes

Common contribution rate: All data requested relates to the common contribution rate, unless otherwise noted.

1 **Membership data:** Average ages should be unweighted, weighted by salary/pension and weighted liability as available. Accrued pensions should include the 2013 Pension Increase Order.

3 **Demographic Assumptions:** We expect this to be shown at sample ages only which will be specified in our template. For example for in service decrement we intend to use five-year intervals from 20 to 65.

3j **Life expectancies:** The life expectancies requested in section 3 j) should be the average life expectancy across the whole fund.

5d **Assumed member contribution yield:** This is the contribution yield that members are assumed to pay over the valuation period. It will vary by authority due to the tiered member contribution rates.

9 **Average employer contribution rate:** This should be calculated as projected employer contributions in 2014/15 divided by projected pensionable pay in 2014/15. Since projected pensionable pay acts only as the weightings in this weighted average, it is acceptable to use a simple projection of pensionable pay (e.g. based on actual pensionable pay at 31 Mar 2013).

10 **Experience over the intervaluation period:** We would only expect experience that has been analysed and is readily available to be included in this section.

11b **State Pension Age used for assessment:** This item refers to the assumed State Pension Ages that have been used in the funding valuation, for example whether allowance has been made for the State Pension Age to increase from age 66 to 67 between 2026 and 2028 (which is Government Policy but has not yet been approved by Parliament).

Adjustment to results for City of Westminster Pension Fund and London Borough of Waltham Forest Pension Fund

C.7 As noted in paragraph 2.9, the purpose of the flags is to identify authorities with whom we might engage and potentially seek additional information from. The importance of clear disclosure in the valuation reports and accurate provision of data from the local authorities and the actuarial firms is highlighted by two examples from our analysis.

C.8 For the City of Westminster Pension Fund, we sought more information from the fund's actuary, clarifying the different actuarial basis that had been applied to some admission bodies, whereas our standard assessment methodology had relied on the same actuarial assumptions being applied for all participating employers in the fund except where this was clear from the valuation report. Based on this additional information, we recalculated our measures and have reported on this revised basis. The result was that Westminster raised only two amber flags.

C.9 For the Borough of Waltham Forest Pension Fund, following engagement with the fund's actuary, we were advised that a material proportion of members had seemingly been incorrectly classified in SF3 data returns. Upon receipt of data reflecting a revised classification of those members, we were able to conclude that Waltham Forest raised only one amber flag.

C.10 Following the 2016 valuation we will request more explicit information and our expectation is that this, together with having highlighted the need for clear and full disclosure and the production of liabilities on the SAB standard basis, will help to improve the overall quality of information provided.

Appendix D: Assumptions

D.1 Each section 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 2013 actuarial valuation
- The SAB standardised set of assumptions, or SAB standard basis
- A market consistent set of assumptions

D.2 Details of local fund assumptions can be found in each fund's actuarial valuation report as at 31 March 2013. An analysis of the differences in assumptions between funds is contained in the 'Consistency' chapter of the main report.

D.3 Details of the SAB standard basis and the market consistent basis can be found in the tables below. Differences between the bases are highlighted in orange.

Table D.1: SAB standard basis[7]

ASSUMPTION	DETAILS
METHODOLOGY	Projected Unit Methodology with 1 year control period
RATE OF PENSION INCREASES	2% per annum
PUBLIC SECTOR EARNINGS GROWTH	3.5% per annum
DISCOUNT RATE	5.06% per annum
POST RETIREMENT MORTALITY RATES	Long term reduction in mortality rates of 1.5% per annum
CHANGES TO STATE PENSION AGE	As legislated
PENSIONER BASELINE MORTALITY	Set locally based on Fund experience
AGE RETIREMENT	Set locally based on Fund experience
ILL HEALTH RETIREMENT RATES	Set locally based on Fund experience
WITHDRAWAL RATES	Set locally based on Fund experience
DEATH BEFORE RETIREMENT RATES	Set locally based on Fund experience
PROMOTIONAL SALARY SCALES	None
COMMUTATION	We have used the SAB future service cost assumption of 65% of the maximum allowable amount. This is equivalent to 23.2% of post 2008 pension and 12.8% of pre 2008 pension
FAMILY STATISTICS	Set locally based on Fund experience

[7] This is the 5 February 2015 iteration, details of which can be found in the minutes of the Scheme Advisory Board's meeting of 5 February 2015 at: http://www.lgpsboard.org/images/PDF/CMCMar2015/Item4-StandardisedFundingAssumptions.pdf

Table D.2: Market consistent basis

ASSUMPTION	DETAILS
METHODOLOGY	Projected Unit Methodology with 1 year control period
RATE OF PENSION INCREASES	2.25% per annum
PUBLIC SECTOR EARNINGS GROWTH	4.5% per annum
DISCOUNT RATE	5.92% per annum
POST RETIREMENT MORTALITY RATES	As set out in GAD's 2013 scheme wide actuarial valuation
CHANGES TO STATE PENSION AGE	As legislated
PENSIONER BASELINE MORTALITY	As set out in GAD's 2013 scheme wide actuarial valuation
AGE RETIREMENT	Set locally based on Fund experience
ILL HEALTH RETIREMENT RATES	Set locally based on Fund experience
WITHDRAWAL RATES	Set locally based on Fund experience
DEATH BEFORE RETIREMENT RATES	Set locally based on Fund experience
PROMOTIONAL SALARY SCALES	Set locally based on Fund experience
COMMUTATION	Set locally based on Fund experience
FAMILY STATISTICS	Set locally based on Fund experience

D.4 The financial assumptions under the market consistent basis were set with reference to GAD's best estimate view of future market movements as at 31 March 2013.

D.5 The post-retirement mortality assumptions are as set out in GAD's 2013 scheme wide actuarial valuation and were derived after analysing scheme wide mortality experience. The market consistent basis uses these assumptions rather than those set locally as analysis showed local rates, when taken as a whole, were materially higher (i.e. life expectancies were materially lower) than GAD's 2013 scheme wide rates.

D.6 Promotional salary scales and rates of commutation are likely to vary between funds. The market consistent basis allows for this variation by using the rates set in the local 2013 actuarial valuations.

Appendix E: Solvency measures – methodology

E.1 This Appendix details the methodology behind the measures used to assess a fund's solvency position. Some of the measures listed below were calculated using a market consistent set of assumptions. For more information on this market consistent basis please see Appendix D.

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

E.2 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 D.

E.3 A lower funding level may lead to greater default risk amongst employers without tax raising powers or statutory backing and can leave a fund at greater risk of adverse market movements.

E.4 This measure assesses the relative funding levels of individual funds. All funds have been ordered by this measure (highest funding level first) and the ten funds ranked 82 to 91, out of 91 are assigned an amber colour code. All other funds are assigned a green colour code.

Open fund: *Whether the fund is open to new members*

E.5 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 employees 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 maturity of the scheme means that additional contributions must be spread over a shorter timeframe, and could be more volatile as a result. Employer interest in the scheme may also start to wane and could lead to a failure to make required contributions in the future.

E.6 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 an amber colour code.

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

E.7 LGPS regulations require employers to pay contributions set in the valuation. DCLG has confirmed that:

> there is a guarantee of LGPS pension liabilities by a public body;

- that public bodies are incapable of becoming insolvent; and
- governing legislation is designed to ensure the solvency and long term economic efficiency of the Scheme.

E.8 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.

E.9 Data for this measure has been taken from the publically available *'Local government pension scheme funds local authority data: 2014 to 2015'* published by DCLG[8]. The data contains the number of employees within each fund by employer group, where:

- Group 1 refers to local authorities and connected bodies;
- Group 2 refers to centrally funded public sector bodies;
- Group 3 refers to other public sector bodies; and
- Group 4 refers to private sector, voluntary sector and other bodies.

E.10 For the purposes of this measure, and unless information has been provided to the contrary, it has been assumed that employers listed under groups 1 and 2 are those ***with*** tax raising powers or statutory backing and that employers listed under groups 3 and 4 are those ***without*** tax raising powers or statutory backing.

E.11 The measure therefore gives the proportion of employees within the fund that are employed by group 1 and 2 employers as a proportion of all employees within the fund.

E.12 The proportions quoted in this report are based on number of employees as at March 2015 as the required data were not available for March 2013. However, it is assumed that this proportion will not have varied much over the two years from the date of the last triennial actuarial valuations, 31 March 2013. The 2016 Section 13 report will use proportions as at March 2016 which we plan to base on liabilities rather than number of employees.

E.13 The required data were not available for:

- Environment Agency Active Fund;
- London Borough of Haringey Pension Fund; and
- London Borough of Newham Pension Fund.

E.14 Under this measure a fund has been allocated a red colour code if their proportion of employees who are employed by an employer without tax raising powers or statutory backing is greater than 50%.

[8] https://www.gov.uk/government/collections/local-government-pension-scheme

E.15 A fund has been allocated an amber colour code if their proportion of employees who are employed by an employer without tax raising powers or statutory is between 25% and 50%, and a green colour code in all other cases.

Contribution cover: *Actual contributions paid by the fund as a proportion of local authority income*

E.16 This measure does not form part of this 2013 dry run report as the required data were unavailable. However, it is expected to be used as a measure of solvency in the 2016 Section 13 report.

E.17 Continued solvency of a fund depends on the ongoing ability of employers to pay contributions into the fund, which may be higher or lower than at present. If contributions are a low proportion of income (or outgo) employers are likely to find it easier to cope with any increase in contributions that is required.

E.18 This measure should give the actual contributions paid by the fund in the 2012/13 financial year as a proportion of local authority income over the same year. It is important to note that this measure is based on actual contributions. These may not be the same as the contribution rates derived in a fund's actuarial valuation as contribution rates are sometimes smoothed to reduce volatility. There may also have been additional lump sum contributions made.

E.19 Under this measure, a fund where the actual contributions paid as a proportion of local authority income are higher than x%[9] will be assigned a red colour code.

E.20 A fund where the actual contributions paid as a proportion of local authority income is between x% and y% will be assigned an amber colour code, while funds with a lower proportion will be assigned a green colour code.

Liability Shock: *The change in average employer contribution rates as a percentage of payroll after a 10% increase in liabilities*

E.21 Contribution rates are normally specified as a percentage of payroll. They are likely to vary at each triennial actuarial valuation in response to economic conditions, both at the time of the valuation and assumed future economic conditions, and fund experience over the inter-valuation period. These factors could cause either an increase or decrease in required contributions.

[9] Where a measure does not form part of the 2013 dry run report trigger points are listed as x% or y%. The actual level of these trigger point will be determined when completing the section 13 review following the 2016 local valuations.

E.22 The continued solvency of a fund depends on the ongoing ability of employers to pay the required contributions into the fund, whether they are higher or lower than at present. If contributions are a low proportion of a fund's payroll employers are likely to find it easier to meet increased required contributions.

E.23 Total employer contribution rates are often split into contributions required to cover the expected cost of future accrual of benefits and contributions required to eliminate any existing deficit. Contributions in respect of deficit will increase if a fund's deficit increases, i.e. if a fund's asset value falls or liabilities increase, assuming the assumptions underlying the deficit remain unchanged.

E.24 This measure investigates the effect of an increase in a fund's liabilities on total employer contribution rates, as a proportion of payroll. The necessary calculations have been undertaken by simulating a one-off increase to liabilities of 10% of their 31 March 2013 value. For the purposes of this measure, liabilities have been set out on the standardised market consistent 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 standardised market consistent basis, the surplus is assumed to be paid back to the employer over a period of 20 years through reduced contribution rates.

E.25 The measure is the change in total employer contribution rate from the resulting from the increase to liabilities. A high figure indicates that contributions rates as a proportion of payroll are highly sensitive to a change in liabilities. This could be a result of a low payroll.

E.26 A fund is allocated a red colour code if its result is greater than 7.5%, an amber colour code if its result is between 5.0% and 7.5% and a green colour code otherwise.

E.27 Note that no results are available for the Environment Agency Closed Fund as there are no remaining active members within the fund with which to calculate contribution rates.

Liability shock cover: *The change in average employer contribution rates as a percentage of local authority income after a 10% increase in liabilities*

E.28 This measure does not form part of this 2013 Section 13 report as the required data were unavailable. However, it is expected to be used as a measure of solvency in the 2016 Section 13 report.

E.29 The results under this measure are expected to be similar to those under the liability shock measure. This measure may therefore be used instead of, rather than in addition to, liability shock in the 2016 Section 13 Report.

E.30 It is likely that a fund where the required employer contributions are a low proportion of total income (or outgo) will be more able to meet any increase in contributions required at future valuations

E.31 Under both measures a fund will be allocated a red colour code if its result is greater than x%, an amber colour code if its result is between x% and y%, and a green colour code otherwise.

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

E.32 This measure shows the effect on total employer contribution rates (as a percentage of payroll) of a one off decrease in the value of a fund's return seeking assets equal to 15% of the value of those assets. Defensive assets are assumed to be unaffected.

E.33 For the purposes of this measure liabilities have restated on the standardised market consistent 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 standardised market consistent basis, the surplus is assumed to be paid back to the employer over a period of 20 years.

E.34 Return-seeking asset classes are assumed to be:

- Overseas Equities;
- UK Equities;
- Other Investments; and
- Property.

Defensive asset classes are assumed to be:

- Cash;
- Gilts; and
- Corporate Bonds.

E.35 We investigated the 'Other Investments' category in respect of the two funds flagged up red under this measure and it was found that only West Midland ITA had a significant amount, of which just over 80% related to a buy-in policy. This buy-in policy has been allowed for as a defensive asset in our calculations.

E.36 Under this measure, a fund invested entirely in return-seeking assets will experience a decrease in total asset value of 15%. A fund with no exposure to return-seeking assets will experience no decrease in total asset value. In practice, the majority of funds will experience decreases between these two extremes, dependant on their investment strategy.

E.37 In general we have treated 'other investments' in the same manner as equities. However, we have investigated the actual nature of 'other investments' where a flag has been raised. We intend to investigate in more depth for our 2016 Section 13 valuation report.

E.38 The one-off decrease in asset values results in an increase in fund deficits (or reduction in surpluses). As deficit recovery periods are constant, employer contributions in respect of deficits will increase. If contributions are a small proportion of payrolls employers are likely to be able to better cope with this increase.

E.39 The measure gives the change in contribution rate from the pre-decrease value. A high number indicates that contribution rates as a proportion of payroll are highly sensitive to a change in the value of return seeking assets.

E.40 A fund is allocated a red colour code if its result is greater than 7.5%, an amber colour code if its result is between 5.0% and 7.5% and a green colour code otherwise.

E.41 Note that no results are available for the Environment Agency Closed Fund as there are no remaining active members within the fund with which to calculate contribution rates.

Asset shock cover: *The change in average employer contribution rates as a percentage of local authority income after a 15% fall in value of return-seeking assets*

E.42 This measure does not form part of this 2013 Section 13 report as the required data were not available. However, it is expected to be used as a measure of solvency in the 2016 Section 13 report.

E.43 The results under this measure are expected to be similar to those under the asset shock measure. This measure may therefore be used instead of, rather than in addition to, the asset shock measure in the 2016 Section 13 Report.

E.44 It is likely that a fund where the required employer contributions are a low proportion of total income (or outgo) will be more able to meet any increase in contributions required at future valuations

E.45 The measure will be calculated in the same way as the asset shock measure, detailed above, except that total contribution rates and the increases resulting from a 15% fall in the value of return-seeking assets will be measured as a percentage of local authority income, rather than a percentage of payroll.

E.46 Under this measure a fund will be allocated a red colour code if its result is greater than x%, an amber colour code if its result is between x% and y% and a green colour code otherwise.

Employer default: *The change in average employer contribution rates as a percentage of payroll if all employer's without tax raising powers or statutory backing default on their existing deficits*

E.47 LGPS regulations require employers to pay contributions set in the valuation. DCLG has confirmed that:

- there is a guarantee of LGPS pension liabilities by a public body;
- that public body is incapable of becoming insolvent; and
- the governing legislation is designed to ensure the solvency and long term economic efficiency of the Scheme.

E.48 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.

E.49 For the purposes of this measure liabilities have been restated on the standardised market consistent 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 standardised market consistent basis, the surplus is assumed to be paid back to the employer over a period of 20 years.

E.50 A fund's deficit will not change as a result of the default, but as the deficit is spread over a smaller number of employers each the contribution rate for each remaining employer will increase.

E.51 If a fund is in surplus it is assumed that those employers without tax raising powers or statutory backing default on their proportion of the surplus. This will have the effect of reducing contributions for those funds in surplus on the standardised market consistent basis who have a non-zero number of employees employed by employers without tax raising powers or statutory backing.

E.52 The measure shows the increase in total contribution rates that has resulted from the default of employers without tax raising powers or statutory backing.

E.53 Data were not available for:

- Environment Agency Active Fund;
- London Borough of Haringey Pension Fund; and
- London Borough of Newham Pension Fund.

E.54 A fund is allocated a red colour code if its result is greater than 3%, an amber colour code if its result is between 2% and 3% and a green colour code otherwise.

Employer default cover: *Average employer contribution rates as a percentage of local authority income if all employer's without tax raising powers or statutory backing default on their existing deficits*

E.55 This measure does not form part of this 2013 Section 13 report as the required data were not available. However, it is expected to be used as a measure of solvency in the 2016 Section 13 report.

E.56 The results under this measure are expected to be similar to those under the employer default measure. This measure may therefore be used instead of, rather than in addition to, the employer default measure in the 2016 Section 13 Report.

E.57 It is likely that a fund where the required employer contributions resulting from a default of employer's without tax raising powers or statutory backing are a low proportion of total income (or outgo) will be more able to meet any increase in contributions required.

E.58 The measure will be calculated as the increases resulting from the default measured as a percentage of local authority income.

E.59 A fund will be allocated a red colour code if its result is greater than x%, an amber colour code if its result is between x% and y% and a green colour code otherwise.

Appendix F: Solvency measures – by fund

Table F1: Solvency measures by fund

PENSION FUND	MATURITY (RANK)	SOLVENCY MEASURES					
		RISKS ALREADY PRESENT			EMERGING RISKS		
		SAB FUNDING LEVEL	OPEN FUND	NON-STATUTORY EMPLOYEES	LIABILITY SHOCK	ASSET SHOCK	EMPLOYER DEFAULT
AVON	5.9 (82)	92%	YES	6%	+3%	+4%	+0%
BARKING AND DAGENHAM	6.5 (45)	83%	YES	21%	+4%	+3%	+1%
BARNET	6.8 (31)	79%	YES	0%	+4%	+3%	+0%
BEDFORDSHIRE	5.9 (76)	78%	YES	4%	+3%	+3%	+0%
BERKSHIRE	5.9 (78)	73%	YES	6%	+3%	+3%	+1%
BEXLEY	7.4 (14)	99%	YES	7%	+4%	+6%	-0%
BRENT	6.9 (28)	67%	YES	0%	+4%	+3%	+0%
BROMLEY	6.8 (33)	93%	YES	2%	+4%	+5%	+0%
BUCKINGHAMSHIRE	5.6 (87)	81%	YES	5%	+3%	+3%	+0%
CAMBRIDGESHIRE	5.8 (83)	89%	YES	5%	+3%	+4%	+0%
CAMDEN	8.6 (7)	91%	YES	9%	+5%	+6%	+0%
CARDIFF AND GLAMORGAN	6.8 (32)	79%	YES	6%	+4%	+4%	+0%
CHESHIRE	6.5 (41)	95%	YES	8%	+4%	+4%	+0%
CITY OF LONDON	7.3 (18)	83%	YES	9%	+4%	+4%	+1%
CLWYD	6 (73)	83%	YES	1%	+3%	+4%	+0%
CORNWALL	5.8 (84)	93%	YES	7%	+3%	+4%	+0%
CROYDON	6.7 (37)	72%	YES	5%	+4%	+3%	+1%
CUMBRIA	6.7 (38)	96%	YES	0%	+4%	+4%	+0%
DERBYSHIRE	5.9 (77)	96%	YES	5%	+3%	+4%	+0%
DEVON	6.4 (48)	82%	YES	11%	+4%	+4%	+1%
DORSET	6 (74)	82%	YES	9%	+3%	+4%	+1%
DURHAM	6.9 (27)	86%	YES	3%	+4%	+4%	+0%
DYFED	5.6 (88)	105%	YES	4%	+3%	+4%	-0%
EALING	6.3 (53)	88%	YES	11%	+4%	+4%	+0%
EAST RIDING	6.3 (55)	93%	YES	4%	+4%	+4%	+0%

PENSION FUND	MATURITY (RANK)	SOLVENCY MEASURES					
		RISKS ALREADY PRESENT			EMERGING RISKS		
		SAB FUNDING LEVEL	OPEN FUND	NON-STATUTORY EMPLOYEES	LIABILITY SHOCK	ASSET SHOCK	EMPLOYER DEFAULT
EAST SUSSEX	6.3 (52)	98%	YES	2%	+4%	+5%	-0%
ENFIELD	6.1 (66)	85%	YES	3%	+4%	+3%	+0%
ENVIRONMENT AGENCY ACTIVE	5.8 (85)	103%	YES	N/A	+3%	+4%	N/A
ESSEX	6.2 (65)	83%	YES	16%	+4%	+4%	+1%
GLOUCESTERSHIRE	6.7 (36)	83%	YES	9%	+4%	+4%	+1%
GREATER MANCHESTER	7.2 (22)	103%	YES	22%	+4%	+5%	-1%
GREENWICH	7.2 (21)	85%	YES	6%	+4%	+5%	+0%
GWENT	5.9 (79)	84%	YES	6%	+3%	+4%	+0%
GWYNEDD	5.2 (90)	102%	YES	5%	+3%	+4%	-0%
HACKNEY	7.4 (15)	86%	YES	0%	+4%	+5%	+0%
HAMMERSMITH	8.9 (6)	83%	YES	6%	+5%	+6%	+0%
HAMPSHIRE	6.4 (50)	80%	YES	3%	+4%	+3%	+0%
HARINGEY	7.8 (11)	84%	YES	N/A	+4%	+5%	N/A
HARROW	6.6 (39)	83%	YES	2%	+4%	+4%	+0%
HAVERING	6.8 (34)	68%	YES	1%	+4%	+3%	+0%
HERTFORDSHIRE	6.4 (49)	94%	YES	6%	+4%	+4%	+0%
HILLINGDON	6.2 (64)	83%	YES	25%	+4%	+3%	+1%
HOUNSLOW	6.3 (58)	84%	YES	14%	+4%	+3%	+1%
ISLE OF WIGHT	7.4 (16)	94%	YES	3%	+4%	+5%	+0%
ISLINGTON	6.8 (30)	86%	YES	7%	+4%	+4%	+0%
KENSINGTON AND CHELSEA	7.7 (13)	96%	YES	5%	+4%	+6%	-0%
KENT	6.2 (63)	83%	YES	10%	+4%	+4%	+1%
KINGSTON-UPON-THAMES	6.1 (71)	85%	YES	6%	+3%	+4%	+0%
LAMBETH	8.9 (5)	87%	YES	5%	+5%	+5%	+0%
LANCASHIRE	6.1 (70)	93%	YES	7%	+3%	+4%	+0%
LEICESTERSHIRE	5.7 (86)	85%	YES	5%	+3%	+3%	+0%
LEWISHAM	7.8 (10)	86%	YES	16%	+4%	+5%	+1%
LINCOLNSHIRE	6.3 (56)	85%	YES	8%	+4%	+4%	+0%

PENSION FUND	MATURITY (RANK)	SOLVENCY MEASURES					
		RISKS ALREADY PRESENT			EMERGING RISKS		
		SAB FUNDING LEVEL	OPEN FUND	NON-STATUTORY EMPLOYEES	LIABILITY SHOCK	ASSET SHOCK	EMPLOYER DEFAULT
LONDON PENSIONS FUND	9.6 (4)	92%	YES	0%	+6%	+4%	+0%
MERSEYSIDE	7.3 (17)	92%	YES	13%	+4%	+5%	+0%
MERTON	7.1 (25)	91%	YES	3%	+4%	+4%	+0%
NEWHAM	7.3 (19)	75%	YES	N/A	+4%	+4%	N/A
NORFOLK	6.6 (40)	91%	YES	9%	+4%	+4%	+0%
NORTH YORKSHIRE	5.3 (89)	87%	YES	3%	+3%	+3%	+0%
NORTHAMPTONSHIRE	6.2 (60)	85%	YES	4%	+4%	+4%	+0%
NORTHUMBERLAND	8.2 (8)	84%	YES	6%	+5%	+5%	+0%
NOTTINGHAMSHIRE	6.3 (54)	85%	YES	6%	+4%	+4%	+0%
OXFORDSHIRE	5.9 (75)	85%	YES	36%	+3%	+4%	+2%
POWYS	6.4 (46)	82%	YES	3%	+4%	+3%	+0%
REDBRIDGE	6.3 (51)	83%	YES	9%	+4%	+3%	+0%
RHONDDA CYNON TAF	6.1 (68)	77%	YES	5%	+3%	+3%	+0%
RICHMOND	7.1 (24)	97%	YES	3%	+4%	+5%	-0%
SHROPSHIRE	6.5 (43)	88%	YES	10%	+4%	+4%	+0%
SOMERSET	5.9 (80)	74%	YES	13%	+3%	+3%	+1%
SOUTH YORKSHIRE	6.4 (47)	94%	YES	10%	+4%	+4%	+0%
SOUTH YORKSHIRE PTA	25.2 (1)	114%	NO	100%	+5%	+3%	N/A
SOUTHWARK	7.3 (20)	84%	YES	2%	+4%	+4%	+0%
STAFFORDSHIRE	6.2 (59)	87%	YES	6%	+4%	+4%	+0%
SUFFOLK	6.2 (62)	93%	YES	19%	+4%	+3%	+0%
SURREY	5.9 (81)	86%	YES	5%	+3%	+4%	+0%
SUTTON	6.5 (42)	81%	YES	3%	+4%	+3%	+0%
SWANSEA	6.2 (61)	80%	YES	4%	+4%	+4%	+0%
TEESSIDE	6.8 (29)	103%	YES	13%	+4%	+5%	-0%
TOWER HAMLETS	8.1 (9)	85%	YES	0%	+5%	+5%	+0%
TYNE AND WEAR	7.1 (23)	87%	YES	11%	+4%	+4%	+0%
WALTHAM FOREST	7 (26)	73%	YES	5%	+4%	+4%	+1%

PENSION FUND	MATURITY (RANK)	SOLVENCY MEASURES					
		RISKS ALREADY PRESENT			EMERGING RISKS		
		SAB FUNDING LEVEL	OPEN FUND	NON-STATUTORY EMPLOYEES	LIABILITY SHOCK	ASSET SHOCK	EMPLOYER DEFAULT
WANDSWORTH	7.7 (12)	104%	YES	1%	+4%	+6%	-0%
WARWICKSHIRE	6.1 (67)	92%	YES	6%	+3%	+4%	+0%
WEST MIDLANDS	6.8 (35)	87%	YES	5%	+4%	+4%	+0%
WEST MIDLANDS ITA	25.1 (2)	100%	NO	100%	+5%	+7%	N/A
WEST SUSSEX	6 (72)	102%	YES	6%	+3%	+5%	-0%
WEST YORKSHIRE	6.5 (44)	94%	YES	13%	+4%	+4%	+0%
WESTMINSTER	10.1 (3)	81%	YES	11%	+6%	+6%	+1%
WILTSHIRE	6.1 (69)	85%	YES	20%	+3%	+4%	+1%
WORCESTERSHIRE	6.3 (57)	83%	YES	8%	+4%	+4%	+0%

Notes:

Funding levels are on the SAB standard basis.

The liability value and salary roll figures in the maturity indicator are as at 31 March 2013. The liability value was calculated on the standardised market consistent basis.

The following charts provide a graphical representation of the total contribution rates payable after the liability shock and asset shock tests above.

*Chart F1: **Liability shock** by fund: Average employer contribution rate as a percentage of payroll after a 10% increase in liabilities, market consistent basis.*

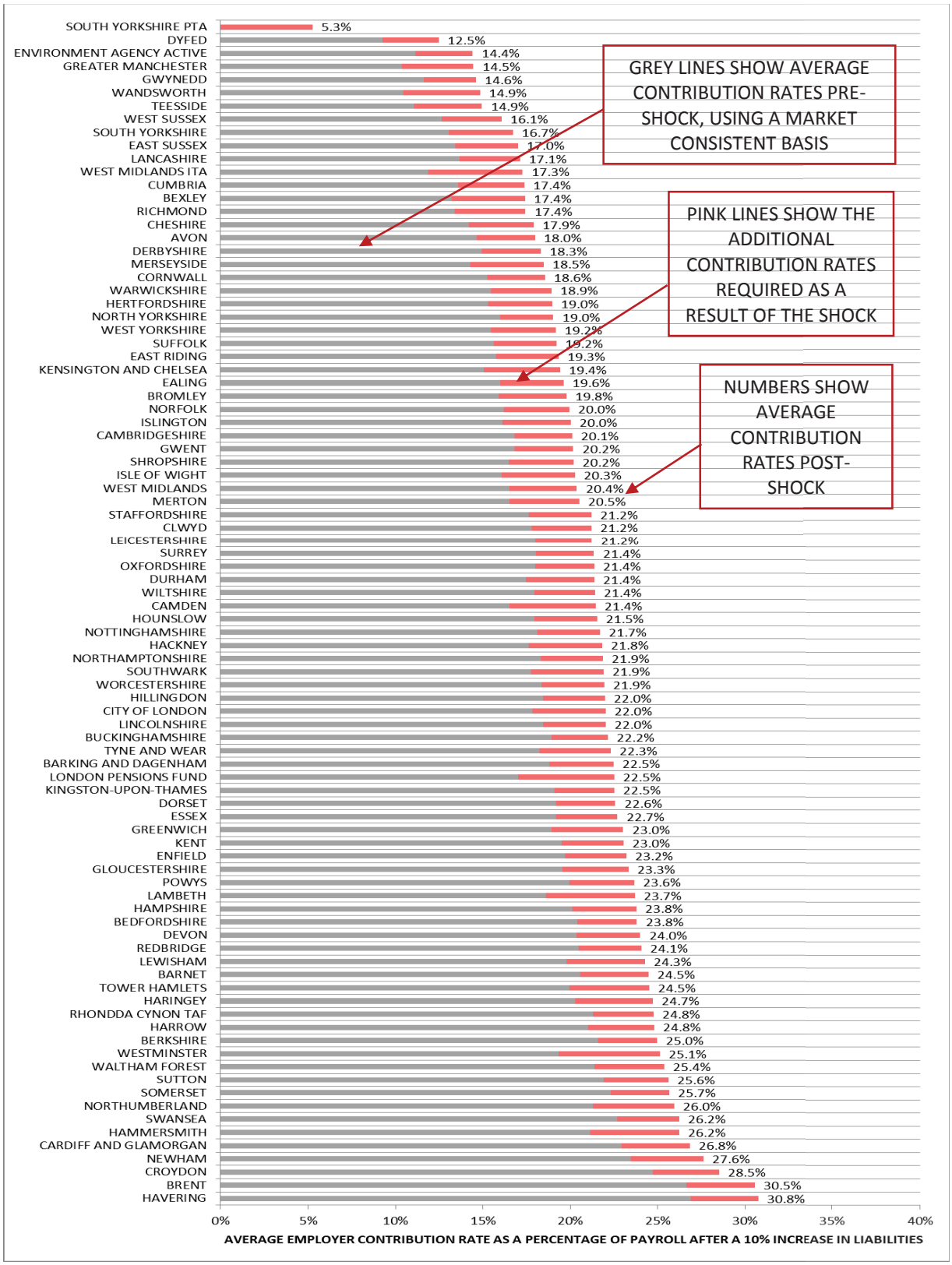
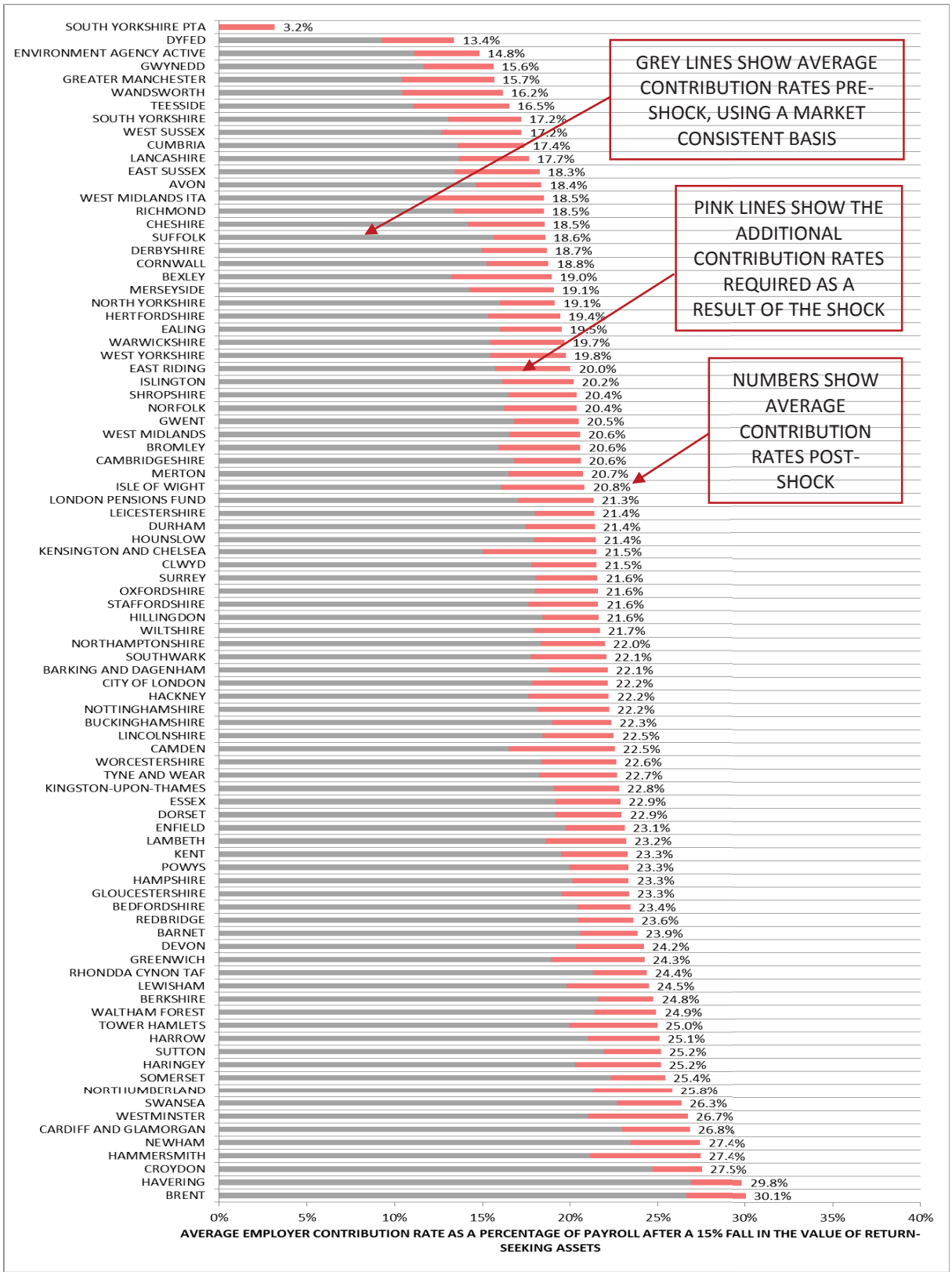


*Chart F2: **Asset shock** by fund: Average employer contribution rate as a percentage of payroll after a 15% fall in value of return seeking assets, market consistent basis.*



Appendix G: Long term cost efficiency measures – methodology

G.1 This Appendix details the methodology behind the measures used to assess a fund's long-term cost efficiency position. Some of the measures listed below were calculated using a market consistent set of assumptions. For more information on this market consistent basis please see Appendix D.

Deficit repaid: *The proportion of deficit paid off annually, where the deficit is calculated on a standardised market consistent basis*

G.2 This measure is based on SAB key indicator 2(i). However, as the discount rate used in the SAB standard basis is not market-related, each fund's deficit and standard contribution rate on the local fund basis have been restated on a standardised market consistent (MC) basis.

G.3 The proportion of deficit paid off annually was calculated as:

$$\frac{(Avg\ ER\ cont\ rate\ paid - ER\ SCR\ on\ MC\ basis) \times Pensionable\ Salary\ roll}{Deficit\ on\ MC\ basis}$$

Where:

- The average employer contribution rate is for the year 2014/15 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 market consistent basis, is for the year 2014/15. It is assumed that the standard contribution rate is equal to the future cost of accrual of that particular fund.
- The salary roll is as at 31 March 2013 and has not been adjusted.
- The deficit on the standardised market consistent basis is as at 31 March 2013.

G.4 The data required for each of the funds to carry out the above calculation was provided by their respective fund actuaries.

G.5 Where appropriate this data has been restated on the standardised market consistent basis.

G.6 Funds that were in surplus or were paying off more than 5% of their deficit annually were flagged as green. Those funds paying off between 0% - 5% of their deficit were flagged as amber and if there were any funds that were actually paying contributions that would result in an increase in deficit, they would have been flagged as red.

Deficit period: *The implied deficit recovery period calculated on a standardised market consistent basis*

G.7 This measure is based on SAB key indicator 3. However, as the SCAPE discount rate used in the SAB standard basis is not market-related, the calculations are done on a standardised market consistent basis.

G.8 The implied deficit recovery period on the standardised market consistent basis was found by solving the following equation for x:

$$\bar{a}_x = \frac{Deficit\ on\ standardised\ MC\ basis}{Annual\ deficit\ recovery\ payment\ on\ standardised\ MC\ basis}$$

G.9 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 market consistent basis.
- e is the general earnings inflation assumption on the standardised market consistent basis.
- The deficit on the standardised market consistent basis is as at 31 March 2013.
- The annual deficit recovery payment on the standardised market consistent basis is calculated as the difference between the average employer contribution rate for the year 2014/15, 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 market consistent basis for the year 2014/15 (which is assumed to be equal to the future cost of accrual of that particular fund).

G.10 Funds that were in surplus or where the implied deficit recovery period was less than 20 years were flagged as green. Those with recovery periods greater than 20 years were flagged as amber. If there were any funds that were paying contributions as a level that would result in an increase in deficit, they would have been flagged as red.

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

G.11 This measure is based on SAB key indicator 4(i). However, as the SCAPE discount rate used in the SAB standard basis is not market-related, the calculations are done on a standardised market consistent basis.

G.12 The following assumptions were made for the purposes of this calculations:

- Time 0 is 31 March 2013.
- Time 20 is 31 March 2033.
- A_0 is the value of the fund's assets at time 0, and was obtained from the data provided by the local fund actuaries.
- A_{20} is the value of the fund's assets at time 20.
- L_0 is the value of the fund's liabilities at time 0, and was obtained from the data provided by the local fund actuaries.
- L_{20} is the value of the fund's liabilities at time 20.
- C_0 is one year's employer contributions paid from time 0. (DCLG's SF3 statistics for the year 2014/15 were used for this purpose).
- $C_{0\text{-}20}$ 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. (DCLG's SF3 statistics for the year 2014/15 were used for this purpose).
- $B_{0\text{-}20}$ 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 and was calculated by restating the standard contribution rates on the local fund bases using the market consistent basis.
- $SCR_{0\text{-}20}$ 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 fund actuaries.
- i is the nominal discount rate assumption on the standardised market consistent basis.
- e is the general earnings assumption on the standardised market consistent basis.
- x is the required investment return that is to be calculated.

G.13 The membership profile is assumed to be constant.

G.14 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:

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

G.15 Given the assumptions and simplifications made in the above calculations, the use of the contribution income and benefit payments from the 2014/15 SF3 data is not likely to have a material impact on the results.

G.16 Funds where the required investment return was higher than the nominal discount rate on the standardised market consistent basis (i.e. i where i = 5.92%) were classified as amber, whereas funds were classified as green if the required return was less than i.

Repayment shortfall: *The difference between the actual deficit recovery contribution rate and the annual deficit recovery contributions required as a percentage of payroll to pay off deficit in 20 years, where the deficit is calculated on a standardised market consistent basis*

G.17 This measure extends the deficit period measure. We calculate the required annual deficit recovery contribution rate on a standardised market consistent basis to pay off the deficit in 20 years' time, and then work out the difference between the actual deficit recovery contribution rate and this rate.

G.18 The 20 year deficit recovery period is based on the SAB key indicator 4(i).

G.19 The required annual deficit recovery contribution rate to be paid on a standardised market consistent basis is equal to:

$$\frac{Deficit\ on\ standardised\ market\ consistent\ basis}{\bar{a}_{20} \times Salary\ roll}$$

Where:

- The deficit on the standardised market consistent basis is as at 31 March 2013.
- $\bar{a}_{20}$ 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 market consistent basis.

- e is the general earnings inflation assumption on the standardised market consistent basis.
- The salary roll is as at 31 March 2013 and has not been adjusted.

G.20 The difference in deficit recovery contribution rates is then defined as:

$$(Avg\ ER\ cont\ rate\ paid - ER\ SCR\ on\ MC\ basis) - \frac{Deficit\ on\ MC\ basis}{\bar{a}_{20} \times Salary\ roll}$$

Where:

- The average employer contribution rate is for the year 2014/15, 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 market consistent basis is for the year 2014/15. It is assumed that the standard contribution rate is equal to the future cost of accrual of that particular fund.

G.21 The data required for each of the funds to carry out the above calculation was provided by their respective fund actuaries.

G.22 Where appropriate these data has been restated on the standardised market consistent basis.

G.23 Funds 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 are flagged as amber. If the difference in deficit recovery contribution rates is less than -3%, then the fund is flagged as red.

Repayment pace: *The amount of deficit paid off over each future valuation period, as a proportion of the deficit disclosed at the last valuation, and the number of years required to pay off 50% of the value of the original deficit, where the deficit calculations are carried out on a standardised market consistent basis*

G.24 The data required to calculate this measure was not available during this dry run. However, we expect this calculations to be included as part of the Section 13 report following the 2016 valuations.

G.25 This first part of this measure is similar to deficit repaid, whilst the second part of this measure is similar to deficit period. Both calculations will need to be carried out on the standardised market consistent basis.

G.26 Part one requires funds to set out what proportion of the deficit they intend to pay off in each of the future valuation periods. Part two requires funds to set out the point in time when they would pay off 50% of the value of the original deficit.

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*

G.27 This measure is based on SAB key indicator 4(ii).

G.28 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 2013.

G.29 The asset data used in this calculation was provided by each fund's respective fund actuary.

G.30 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% were flagged as amber, whilst those where the best estimate returns were lower than the required investment returns were flagged as red.

Deficit extension: *The change in each fund's reported deficit recovery period from the 2010 valuation to the 2013 valuation*

G.31 This measure compares the deficit recovery periods as at 31 March 2010 and 31 March 2013, using the data provided by each fund's actuary.

G.32 Funds where the deficit recovery period had increased by more than 6 years were flagged as red, where the deficit recovery period had increased by less than 6 years were flagged as amber and where there was no change or the deficit recovery period was shorter in 2013 were flagged as green.

Interest cover: *A check on whether the annual deficit recovery contributions paid by the fund are sufficient to cover the annual interest payable on that deficit, where the deficit is calculated on a standardised market consistent basis*

G.33 This measure was triggered if the following inequality did not hold true:

$$(Avg\ ER\ cont\ rate\ paid - ER\ SCR\ on\ MC\ basis) \times Sal\ roll > Deficit\ on\ MC\ basis \times i$$

Where:

- The average employer contribution rate is for the year 2014/15, 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 market consistent basis is for the year 2014/15. It is assumed that the standard contribution rate is equal to the future cost of accrual of that particular fund.
- The salary roll is as at 31 March 2013 and has not been adjusted.
- The deficit on the standardised market consistent basis is as at 31 March 2013.
- i is the nominal interest rate assumption on the standardised market consistent basis.

G.34 The data required for each of the funds to carry out the above calculation was provided by their respective fund actuaries.

G.35 Where appropriate these data have been restated on the standardised market consistent basis.

G.36 Funds that paid sufficient annual deficit recovery contributions to cover the annual interest payable on the deficit were flagged as green, whilst those that did not were flagged as red.

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*

G.37 The data required to calculate this measure were not available during this dry run. However, we expect this calculations to be included as part of the Section 13 report following the 2016 valuations.

G.38 This measure will be used to monitor the change in the length of the deficit recovery period set locally by the fund at each valuation and what the underlying reasons are for any adverse changes in this period.

G.39 For example, if a fund's deficit recovery period has increased from the value calculated in the previous valuation, was this due to the fund not paying sufficient deficit recovery contributions over the inter-valuation period, or was this due unfavourable demographic experience, such as increasing longevity.

Surplus retention: *Confirmation that contributions from funds not in deficit are not likely to lead to a deficit arising in the future.*

G.40 Note that all the funds that were in surplus on the market consistent basis were paying sufficient contributions to cover ongoing accrual of benefits on that basis.

G.41 This measure has therefore been excluded from our tables of long term cost efficiency measures for the purposes of the LGPS England and Wales Section 13 Dry Run Report as no funds triggered an amber or red flag.

G.42 This measure looks at the funding level of the funds that were in surplus on the standardised market consistent basis.

G.43 The fund would be need to pay sufficient contributions after allowing for future costs of accrual, such that:

$$Avg\ ER\ cont\ rate\ paid - ER\ SCR\ on\ MC\ basis > 0$$

Where:

- The average employer contribution rate is for the year 2014/15, 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 market consistent basis is for the year 2014/15. It is assumed that the standard contribution rate is equal to the future cost of accrual of that particular fund.

G.44 The data required for each of the funds to carry out the above calculation were provided by their respective fund actuaries.

G.45 Where appropriate these data have been restated on the standardised market consistent basis.

Appendix H: Long term cost efficiency measures – by fund

Table H1: Long term cost efficiency measures by fund

PENSION FUND	MATURITY (RANK)	LONG TERM COST EFFICIENCY MEASURES						
		RELATIVE CONSIDERATIONS				ABSOLUTE CONSIDERATIONS		
		DEFICIT REPAID	DEFICIT PERIOD	REQUIRED RETURN	REPAYMENT SHORTFALL	RETURN SCOPE	DEFICIT EXTENSION	INTEREST COVER
AVON	5.9 (82)	>50%	1	2%	16%	4.3%	-3	Yes
BARKING AND DAGENHAM	6.5 (45)	18%	6	3%	9%	2.5%	0	Yes
BARNET	6.8 (31)	15%	7	3%	9%	2.2%	0	Yes
BEDFORDSHIRE	5.9 (76)	11%	9	4%	6%	1.8%	0	Yes
BERKSHIRE	5.9 (78)	4%	34	6%	-2%	-0.5%	-3	No
BEXLEY	7.4 (14)	IN SURPLUS	IN SURPLUS	4%	7%	2.5%	0	Yes
BRENT	6.9 (28)	9%	12	4%	6%	2.3%	-3	Yes
BROMLEY	6.8 (33)	>50%	2	3%	13%	3.1%	3	Yes
BUCKINGHAMSHIRE	5.6 (87)	8%	13	5%	2%	1.2%	-3	Yes
CAMBRIDGESHIRE	5.8 (83)	18%	6	4%	5%	2.1%	0	Yes
CAMDEN	8.6 (7)	43%	2	3%	14%	3.2%	0	Yes
CARDIFF AND GLAMORGAN	6.8 (32)	9%	13	5%	3%	0.9%	-2	Yes
CHESHIRE	6.5 (41)	>50%	0	2%	14%	3.9%	0	Yes
CITY OF LONDON	7.3 (18)	7%	15	5%	1%	0.8%	0	Yes
CLWYD	6 (73)	17%	6	3%	8%	2.7%	-2	Yes
CORNWALL	5.8 (84)	>50%	2	3%	9%	2.4%	0	Yes
CROYDON	6.7 (37)	8%	14	5%	3%	1.2%	-2	Yes
CUMBRIA	6.7 (38)	>50%	0	2%	19%	3.7%	-3	Yes
DERBYSHIRE	5.9 (77)	>50%	0	4%	7%	1.7%	0	Yes
DEVON	6.4 (48)	7%	15	5%	2%	0.6%	-5	Yes
DORSET	6 (74)	8%	15	5%	1%	0.8%	0	Yes
DURHAM	6.9 (27)	16%	6	4%	7%	1.5%	-1	Yes
DYFED	5.6 (88)	IN SURPLUS	IN SURPLUS	3%	7%	3.0%	0	Yes
EALING	6.3 (53)	20%	5	4%	8%	2.0%	-3	Yes
EAST RIDING	6.3 (55)	>50%	2	3%	10%	2.6%	0	Yes

PENSION FUND	MATURITY (RANK)	LONG TERM COST EFFICIENCY MEASURES						
		RELATIVE CONSIDERATIONS				ABSOLUTE CONSIDERATIONS		
		DEFICIT REPAID	DEFICIT PERIOD	REQUIRED RETURN	REPAYMENT SHORTFALL	RETURN SCOPE	DEFICIT EXTENSION	INTEREST COVER
EAST SUSSEX	6.3 (52)	IN SURPLUS	IN SURPLUS	3%	9%	3.2%	0	Yes
ENFIELD	6.1 (66)	12%	9	5%	4%	0.7%	0	Yes
ENVIRONMENT AGENCY ACTIVE	5.8 (85)	IN SURPLUS	IN SURPLUS	N/A	N/A	N/A	3	N/A
ESSEX	6.2 (65)	14%	8	4%	6%	2.1%	0	Yes
GLOUCESTERSHIRE	6.7 (36)	19%	6	3%	10%	2.9%	0	Yes
GREATER MANCHESTER	7.2 (22)	IN SURPLUS	IN SURPLUS	2%	8%	3.7%	0	Yes
GREENWICH	7.2 (21)	8%	13	5%	2%	1.2%	0	Yes
GWENT	5.9 (79)	13%	8	5%	5%	1.5%	5	Yes
GWYNEDD	5.2 (90)	IN SURPLUS	IN SURPLUS	2%	10%	3.8%	0	Yes
HACKNEY	7.4 (15)	40%	3	1%	19%	5.4%	-2	Yes
HAMMERSMITH	8.9 (6)	9%	12	5%	4%	1.0%	-3	Yes
HAMPSHIRE	6.4 (50)	9%	12	5%	3%	0.6%	-3	Yes
HARINGEY	7.8 (11)	14%	7	4%	7%	1.8%	0	Yes
HARROW	6.6 (39)	9%	12	5%	3%	1.0%	0	Yes
HAVERING	6.8 (34)	8%	14	4%	3%	1.4%	0	Yes
HERTFORDSHIRE	6.4 (49)	>50%	1	3%	11%	2.9%	0	Yes
HILLINGDON	6.2 (64)	12%	9	4%	4%	1.3%	0	Yes
HOUNSLOW	6.3 (58)	12%	9	5%	5%	1.1%	0	Yes
ISLE OF WIGHT	7.4 (16)	>50%	2	4%	9%	2.4%	0	Yes
ISLINGTON	6.8 (30)	18%	6	4%	8%	1.8%	-3	Yes
KENSINGTON AND CHELSEA	7.7 (13)	IN SURPLUS	IN SURPLUS	4%	7%	2.1%	-3	Yes
KENT	6.2 (63)	11%	10	5%	5%	1.5%	0	Yes
KINGSTON-UPON-THAMES	6.1 (71)	19%	5	3%	8%	3.0%	0	Yes
LAMBETH	8.9 (5)	30%	3	2%	17%	3.6%	0	Yes
LANCASHIRE	6.1 (70)	>50%	2	4%	10%	1.9%	0	Yes
LEICESTERSHIRE	5.7 (86)	13%	8	5%	4%	1.5%	0	Yes
LEWISHAM	7.8 (10)	11%	9	5%	4%	1.3%	0	Yes
LINCOLNSHIRE	6.3 (56)	14%	8	4%	5%	1.9%	0	Yes

PENSION FUND	MATURITY (RANK)	LONG TERM COST EFFICIENCY MEASURES						
		RELATIVE CONSIDERATIONS				ABSOLUTE CONSIDERATIONS		
		DEFICIT REPAID	DEFICIT PERIOD	REQUIRED RETURN	REPAYMENT SHORTFALL	RETURN SCOPE	DEFICIT EXTENSION	INTEREST COVER
LONDON PENSIONS FUND	9.6 (4)	48%	2	2%	20%	4.0%	-3	Yes
MERSEYSIDE	7.3 (17)	>50%	1	1%	24%	4.9%	-3	Yes
MERTON	7.1 (25)	>50%	1	1%	20%	5.2%	-3	Yes
NEWHAM	7.3 (19)	10%	11	4%	6%	2.1%	0	Yes
NORFOLK	6.6 (40)	33%	3	4%	9%	2.4%	0	Yes
NORTH YORKSHIRE	5.3 (89)	27%	4	3%	10%	2.6%	-3	Yes
NORTHAMPTONSHIRE	6.2 (60)	20%	5	4%	9%	2.4%	0	Yes
NORTHUMBERLAND	8.2 (8)	14%	8	4%	7%	1.4%	-3	Yes
NOTTINGHAMSHIRE	6.3 (54)	10%	10	5%	3%	1.2%	0	Yes
OXFORDSHIRE	5.9 (75)	12%	9	4%	4%	1.5%	0	Yes
POWYS	6.4 (46)	12%	9	4%	6%	1.3%	0	Yes
REDBRIDGE	6.3 (51)	13%	8	4%	5%	1.5%	0	Yes
RHONDDA CYNON TAF	6.1 (68)	11%	10	5%	6%	1.3%	0	Yes
RICHMOND	7.1 (24)	IN SURPLUS	IN SURPLUS	3%	13%	3.1%	0	Yes
SHROPSHIRE	6.5 (43)	17%	6	4%	6%	1.6%	0	Yes
SOMERSET	5.9 (80)	5%	24	6%	-1%	0.0%	0	No
SOUTH YORKSHIRE	6.4 (47)	>50%	1	2%	17%	3.7%	-3	Yes
SOUTH YORKSHIRE PTA	25.2 (1)	IN SURPLUS	IN SURPLUS	N/A	11%	N/A	N/A	Yes
SOUTHWARK	7.3 (20)	17%	6	4%	7%	2.0%	-3	Yes
STAFFORDSHIRE	6.2 (59)	23%	5	4%	9%	2.4%	5	Yes
SUFFOLK	6.2 (62)	>50%	1	2%	13%	2.9%	0	Yes
SURREY	5.9 (81)	22%	5	3%	9%	3.0%	0	Yes
SUTTON	6.5 (42)	11%	10	4%	5%	1.4%	0	Yes
SWANSEA	6.2 (61)	10%	10	4%	4%	1.6%	0	Yes
TEESSIDE	6.8 (29)	IN SURPLUS	IN SURPLUS	5%	3%	1.3%	-3	Yes
TOWER HAMLETS	8.1 (9)	22%	5	3%	11%	3.4%	0	Yes
TYNE AND WEAR	7.1 (23)	22%	5	4%	10%	2.2%	0	Yes
WALTHAM FOREST	7 (26)	11%	9	3%	10%	2.4%	0	Yes

PENSION FUND	MATURITY (RANK)	LONG TERM COST EFFICIENCY MEASURES						
		RELATIVE CONSIDERATIONS				ABSOLUTE CONSIDERATIONS		
		DEFICIT REPAID	DEFICIT PERIOD	REQUIRED RETURN	REPAYMENT SHORTFALL	RETURN SCOPE	DEFICIT EXTENSION	INTEREST COVER
WANDSWORTH	7.7 (12)	IN SURPLUS	IN SURPLUS	4%	9%	2.3%	-3	Yes
WARWICKSHIRE	6.1 (67)	40%	3	4%	7%	2.4%	0	Yes
WEST MIDLANDS	6.8 (35)	19%	6	4%	8%	2.0%	-3	Yes
WEST MIDLANDS ITA	25.1 (2)	IN SURPLUS	IN SURPLUS	N/A	45%	N/A	N/A	Yes
WEST SUSSEX	6 (72)	IN SURPLUS	IN SURPLUS	3%	9%	2.9%	0	Yes
WEST YORKSHIRE	6.5 (44)	44%	2	5%	2%	0.7%	0	Yes
WESTMINSTER	10.1 (3)	8%	15	5%	3%	0.9%	-5	Yes
WILTSHIRE	6.1 (69)	17%	6	4%	6%	2.1%	0	Yes
WORCESTERSHIRE	6.3 (57)	14%	7	4%	7%	2.0%	2	Yes

Notes:

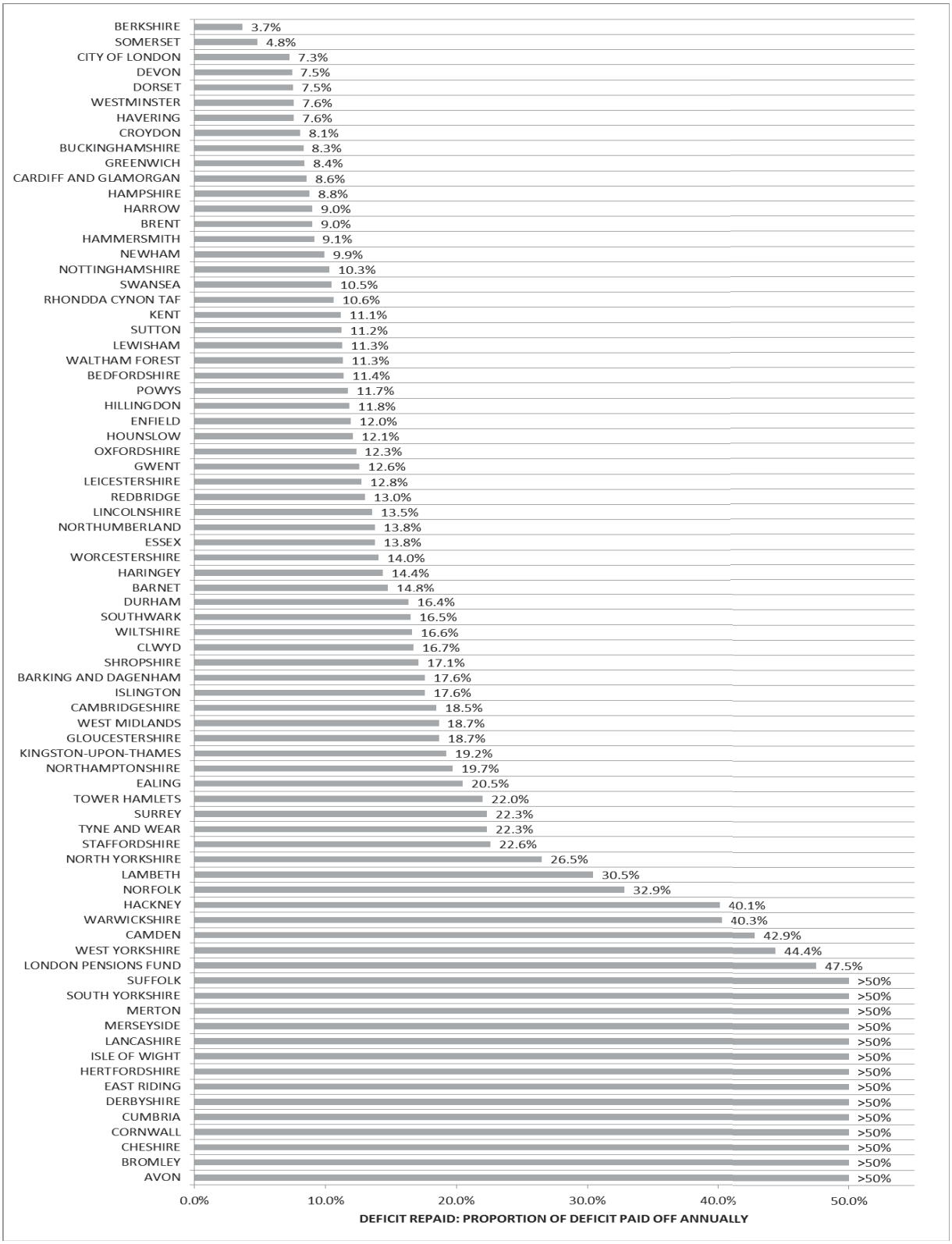
The liability value and salary roll figures in the maturity indicator are as at 31 March 2013. The liability value was calculated on the standardised market consistent basis.

The 'Required Return' and 'Return Scope' measures were not calculated for South Yorkshire PTA and West Midlands ITA as these are closed funds. They were also not calculated for the Environment Agency Open fund as the DCLG SF3 statistics did not contain data for the fund.

The 'Deficit Extension' measure was not calculated for South Yorkshire PTA and West Midlands ITA as information on deficit recovery periods was not available.

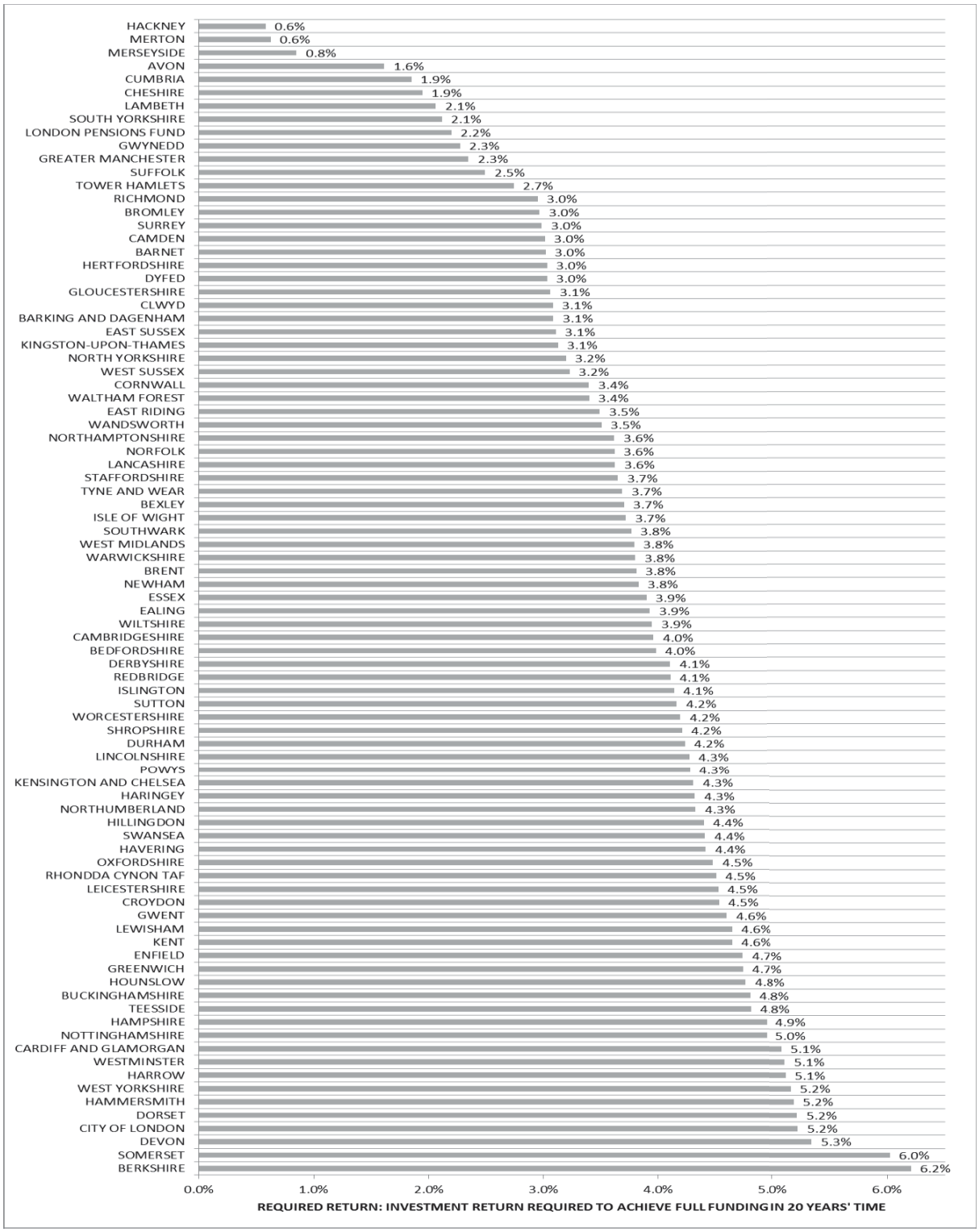
The following charts provide a graphical representation of the 'Deficit Repaid' and 'Required Return' measures.

*Chart H1: **Deficit Repaid** by fund: The proportion of deficit paid off annually.*



Note: Funds in surplus have been excluded.

*Chart H2: **Required Return** by fund: The investment return required to achieve full funding in 20 years' time.*



Note: Neither closed funds nor the Environment Agency Active fund were assessed under this measure.