

Council Meeting

**Wednesday, 12th
February, 2020**

HASTINGS BOROUGH COUNCIL

Dear Councillor

You are hereby summoned to attend a meeting of the Hastings Borough Council to be held at the Council Chamber, Muriel Matters House, Breeds Place, Hastings, East Sussex, TN34 3UY, on Wednesday, 12th February, 2020 at 6.00 pm at which meeting the business specified below is proposed to be transacted.

Yours sincerely,

Chief Legal Officer

Muriel Matters House
Breeds Place
Hastings

5 February 2020

AGENDA

1. Apologies for Absence
2. To approve as a correct record the minutes of the last meeting held on 18th December 2020.
3. Declarations of Interest
4. Announcements from the Mayor and Leader
5. Questions (if any) from:
 - a) Members of the public under Rule 11
 - b) Councillors under Rule 12
6. Motion (Rule 14)
7. Membership of Committees
To give effect to any request received from a political group for a change in their representation on committee(s).

8. Reports of Committees

- a) To resolve that the public be excluded from the meeting during the discussion of any items considered while the public were excluded by the relevant committee because it is likely that if members of the public were present there would be disclosure to them of exempt information as defined in the respective paragraphs of Schedule 12A to the Local Government Act 1972 referred to in the minutes of the relevant committee.
- b) To receive and consider the recommendations and any decisions of the following committees.

Minute No.	Subject	Cabinet Member /Chair
CABINET – 18 DECEMBER 2019		
221.	Harold Place Proposals	Chowney
223. (E)	Potential Commercial Property Purchase	Chowney
CABINET – 6 JANUARY 2020		
227.	Bohemia Leisure and Cultural Facilities Study	Forward
228.	Treasury Management – Mid-Year Report 2019-20	Chowney
229.	Town Deal	Chowney
230.	Buckshole Reservoir	Fitzgerald
CABINET – 3 FEBRUARY 2020		
234. (C)	Local Nature Reserves - Byelaws	Fitzgerald
236. (C)	Pay Policy Statement 2020/21	Rogers
237. (C)	Review of HMO Licensing Fees	Batsford

Notes:

1. The Mayor will call over the minutes and members will rise and indicate those items which they wish to have discussed.
2. No discussion shall take place at this stage upon part II minutes

covered by the resolution 8a) above. Any such discussion shall be deferred to item 9 on the agenda.

9. To consider the recommendations and decisions of committees (if any) which the Council has resolved should be discussed after the exclusion of the public from the meeting.

Appendix - Cabinet Agendas 18 December 2019, 6 January 2020 & 3 February 2020

Note: Nothing contained in this agenda or in the attached reports and minutes of committees constitutes an offer or acceptance of an offer or an undertaking or contract by the Borough Council

Agenda Item 2 Public Document Pack

FULL COUNCIL

18 DECEMBER 2019

Present: Councillors Sinden (Chair), Bacon (Vice-Chair), Barnett, Battley, Batsford, Beaney, Beaney, Beaver, Berelson, Bishop, Chowney, Cox, Davies, Edwards, Evans, Fitzgerald, Foster, Lee, Levane, Louise, Marlow-Eastwood, O'Callaghan, Patmore, Rankin, Rogers, Roberts, Sabetian, Scott, Turner and Webb

92. APOLOGIES FOR ABSENCE

Apologies were received from Councillors Forward and Charman

93. TO APPROVE AS A CORRECT RECORD THE MINUTES OF THE LAST MEETING

RESOLVED that the minutes of the Full Council meeting held on 23rd October 2019 be approved and signed by the Mayor as a correct record of the proceedings.

94. DECLARATIONS OF INTEREST

None

95. ANNOUNCEMENTS FROM THE MAYOR AND LEADER

The leader of the Council congratulated the recently elected MP, Sally-Ann Hart. He believes in democracy and recognises that the people have spoken. He gave her 3 messages to consider;

1. **Transport Infra structure:** focus on resolving transport problems involving cycling and walking rather than the HS1 train connections to London.
2. **Homelessness:** large amounts of money have been paid out to cover costs of temporary accommodation. The Local Housing Allowance needs to be raised as people cannot afford private accommodation. There needs to be more homes available to people.
3. **Council Budgets:** Both Hastings Borough Council and Rother District Council need more money to deliver services. Any further cuts to budgets may mean that both Councils are unable to deliver core services.

96. QUESTIONS (IF ANY) FROM:

96.1 Members of the Public under Rule 11

A written question was received from Julia Hilton regarding the Councils recently received My Town funding and its allocation. Councillor Forward provided a written

FULL COUNCIL

18 DECEMBER 2019

response. Copies of the question and response were circulated to Councillors and members of the public.

Ms Hilton asked a supplementary question. There are a great number of community groups in the town who could help build a vision for the town and facilitate it. They would also be useful in developing a climate change plan. Would the Council be advertising for this sort of input?

In the absence of Councillor Forward, Councillor Chowney responded. The Council is still awaiting guidance about how this will operate. The questioner raised good ideas which could be fulfilled with smaller contracts. He would like to see engagement from people from the deprived wards. These people rarely engage as they are occupied with worrying where the next meal will come from. We need to be thinking about what they need and there will be opportunity for developing the system for this. Any appointments would be advertised locally.

96.2 Councillors under rule 12

Questions to the Leader, Deputy Leader and portfolio holders were asked and answered in accordance with Rule 12.1 as follows:

Questioner	Subject	Reply given by
Councillor Lee	<u>Working with MP-</u> Will he present his ideas and collaborate working with the new MP? Councillor Chowney replied that he would as he has done with the previous MP	Councillor Chowney
Councillor Davies	<u>Street Cleansing-</u> Overview and Scrutiny were unanimous in its praise for the DSO (street cleansing). How will it be improved in the forthcoming year? Councillor Fitzgerald replied that he was pleased with the success for this and has received positive feedback from the public. Will be looking to deploy resources to north parts of the borough and exploring commercial opportunities	Councillor Fitzgerald
Councillor Beaver	<u>Flood Risk-</u> At the Annual Council held on 23 October, it was said that Cornwallis car park wasn't suitable for housing as it was a flood risk area, will he apply this throughout the town? Councillor Chowney replied that mitigation wasn't worth applying given the size of the site. Other parts of the town are bigger and we get grants to help with this.	Councillor Chowney
Councillor Scott	<u>Fairer Funding Review-</u> After 10 years of	Councillor

FULL COUNCIL

18 DECEMBER 2019

	<p>austerity Leaders from East Sussex were hoping to benefit from the fairer funding review. This has currently been postponed by the government. Will Hastings Borough Council write to the government to bring this forward?</p> <p>Councillor Chowney replied that he was hoping to get all Leaders from East Sussex to write a joint letter. The fairer funding review has been long overdue</p>	Chowney
Councillor Patmore	<p><u>Bathing Pool Site-</u> Back in October it was said that we were close to signing the terms of the lease for the Bathing Pool Site. Has this happened?</p> <p>Councillor Chowney replied that this didn't happen within the 2 weeks stated at the time due to complications. Lease is now ready to be signed but he wants to look at it first before it goes to the board of directors.</p>	Councillor Chowney
Councillor Turner	<p><u>Doctors shortage-</u> a number of residents can't get on a doctors panel and many surgeries are not taking on new NHS patients. When he meets the new MP can he ask her to help with getting better primary services?</p> <p>Councillor Chowney replied that we are currently 15 GPs short in Hastings which has caused a serious problem. Thankfully the walk in centre was saved. It's a general problem the country is facing. He will raise this with the new MP.</p>	Councillor Chowney

97. MOTION (RULE 14)

None received

98. MEMBERSHIP OF COMMITTEES

No changes requested

99. HOMELESSNESS AND ROUGH SLEEPING STRATEGY

Councillor Batsford proposed the Homelessness and Rough Sleeping Strategy as set out in the agenda. This was seconded by Councillor Davies.

RESOLVED (unanimously) that the Council does accept the recommendations as set out below:

1. To the draft Homelessness Review and Homelessness and Rough Sleeping

FULL COUNCIL

18 DECEMBER 2019

Strategy is adopted and published

- 2. Delegated authority is given to the Assistant Director, Housing and Built Environment, in consultation with the Lead Member for Housing and Leisure, to agree any minor changes to improve the layout and readability of the strategy prior to publication**
- 3. An action plan to implement the strategy priorities is developed with partners**
- 4. An annual performance update is submitted to Cabinet, setting out progress against the strategy priorities and action plan**

Reasons for Recommendations

The council needs to consult on a new Homelessness and Rough Sleeping Strategy prior to adoption.

100. REPORTS OF COMMITTEES

The Mayor having called over the minutes set out in the agenda, none were reserved for discussion.

(The Chair declared the meeting closed at. 6.47 pm)

Agenda Item 10 Document Pack

Cabinet Agenda

Wednesday, 18 December 2019 at 5.00 pm

Council Chamber, Muriel Matters House, Breeds Place, Hastings, East Sussex, TN34 3UY

If you are attending Muriel Matters House for this meeting, please enter the building via the Tourist Information Centre entrance. Members of public are advised that they will need to sign in to comply with health and safety legislation and will be escorted up to the Council Chamber.

For further information, please contact Democratic Services on 01424 451484 or email: democraticservices@hastings.gov.uk

	Page No.
1. Apologies for Absence	
2. Minutes of Last Meeting	1 - 4
3. Declaration of Interests	
4. Harold Place Development Proposals <i>(Peter Grace, Assistant Director, Financial Services and Revenues) (Cabinet Decision)</i>	5 - 10
5. Notification of Additional Urgent Items	
6. Urgent Items (if any)	
7. Exclusion of the Public To resolve that the public be excluded from the meeting during the consideration of the items of business listed below because it is likely that if members of the public were present there would be disclosure to them of "exempt" information as defined in the paragraphs of schedule 12A to the Local Government Act 1972 referred to in the relevant report	
8. Potential Commercial Property Purchase <i>(Peter Grace, Assistant Director, Financial Services and Revenues) (Cabinet Decision)</i>	11 - 22

This page is intentionally left blank

Agenda Item 2 Public Document Pack CABINET

4 NOVEMBER 2019

Present: Councillors Chowney (Chair), Forward (Vice-Chair), Batsford, S Beaney, Evans, Fitzgerald, Lee and Patmore.

211. APOLOGIES FOR ABSENCE

Councillor Judy Rogers sent apologies for absence.

212. DECLARATION OF INTERESTS

None declared.

213. MINUTES OF LAST MEETING

RESOLVED – that the minutes of the Cabinet meeting held on 7th October 2019 be approved as a true record.

RESOLVED the chair called over the items on the agenda, under rule 13.3 of the council's constitution, the recommendations set out in minute number 215 was agreed without being called for discussion.

214. HOUSING RENEWAL FINANCIAL ASSISTANCE POLICY

The Assistant Director, Housing and Built Environment submitted a report outlining the Housing Renewal Financial Assistance Policy. The report presented a revised policy for 2019

The report was presented by the Assistant Director, Housing and Built Environment.

The Housing Renewal Financial Assistance Policy sets out the financial tools available to the Council for providing financial assistance to households in Hastings for housing renewal.

The Council is required to have such a policy under the Regulatory Reform (Housing Assistance) (England and Wales) Order 2002. This is reviewed each year and due to substantial changes, Cabinet approval is needed. Changes are for the new forms of financial assistance and support for residents. The aim is to help people stay in their accommodation longer and take up new accommodation previously inaccessible. There has historically been an underspend for this fund but with the new flexibility this policy offers it is expected that more people will be able to access the fund.

The policy includes Housing Renewal Loans, Disabled Facilities Grant Funding & the Better Care Fund and Seconded Occupational Therapists.

Housing Renewal Loans are used for improvement works due to the Council having limited resources. This is done in partnership with Parity Trust.

CABINET

4 NOVEMBER 2019

Disabled Facilities Grants (DFGs) are given to vulnerable clients to enable them to remain in their own home and remain independent. DFGs form part of the wider Better care Fund.

Occupational Therapists are seconded into housing. This is an innovative scheme which sees officers from East Sussex County Council (ESCC) and the East Sussex districts and boroughs have working together.

Councillors commented that a number of their ward residents have benefitted from previous works funded through measures such as DFGs. They also highlighted the fuel poverty issues people are experiencing and how this policy would help with this. They were supportive as they felt that more people would benefit due to the increase in flexibility the new policy offers.

Councillor Batsford proposed approval of the recommendations of the report, seconded by Councillor Evans.

RESOLVED (Unanimously)

- 1. Cabinet approves the revised Housing Renewal Financial Assistance Policy 2019 at Appendix 1.**
- 2. Delegated authority is given to the Assistant Director Housing and Built Environment in consultation with the Lead Member to introduce new types of assistance that enable existing and new sources of funding to be targeted at eligible clients.**

Reasons for the decision

To be able to respond promptly to freedoms provided by the provision of Disabled Facilities Grant funding through the Better Care Fund delegated authority is requested to develop and adopt new types of financial assistance for housing renewal.

215. HOUSING RENEWAL ENFORCEMENT POLICY

The Assistant Director, Housing and Built Environment submitted a report outlining substantive amendments required to the Housing Renewal Enforcement policy.

The Housing Renewal Enforcement Policy is reviewed by officers annually and amended to include minor revisions. During the most recent review officers considered the recent Ministry of Housing Communities and Local Government guidance on rogue landlord enforcement and recent experience of the use of the new enforcement provisions introduced by the Housing and Planning Act 2016.

As significant amendments are required from the review Cabinet approval is required.

Under rule 13.3 the recommendations of the report were agreed without being called for discussion.

RESOLVED

CABINET

4 NOVEMBER 2019

- 1. The revised Housing Renewal Enforcement Policy (Version 2.0) is approved.**
- 2. Cabinet are recommended to delegate future minor amendments to the Lead Member in consultation with the Assistant Director Housing and Built Environment and Chief Legal Officer**

Reasons for the decision

Due to the substantive changes proposed to the previously approved Housing Renewal Enforcement Policy Cabinet approval is required.

216. NOTIFICATION OF ADDITIONAL URGENT ITEMS

Notice of an urgent item was given under Rule 26 of the Access to Information Rules contained in the Council's Constitution.

217. POTENTIAL COMMERCIAL PROPERTY PURCHASES (PART 2)

RESOLVED that the public be excluded from the meeting during the, consideration of the items of business listed below because it is likely that if members of the public were present there would be disclosure to them of “exempt” information as defined in the paragraphs of schedule 12A to the Local Government Act 1972 referred to in the relevant report.

The Assistant Director Financial Services & Revenues submitted a report to consider the potential acquisition of two commercial properties within Hastings:

1. Property A
2. Property B

The report was presented by the Assistant Director Financial Services & Revenues

The Council needs to ensure that key areas remains attractive for the future to ensure businesses are attracted to, and remain in, Hastings – particularly so as the Council will need to ensure business rate growth in the future.

Both properties provide the Council with the opportunity to diversify its property holdings and change the overall risk exposure within the portfolio. The Council would also secure additional income streams. Both properties scored highly on the property matrix used to help determine purchasing.

Councillors were in support of purchasing the property due to the key locations occupied, future regeneration and development should the current leases not be renewed and also for the additional income generation.

Councillor Chowney proposed approval of the recommendations of the report, seconded by Councillor Fitzgerald.

CABINET

4 NOVEMBER 2019

RESOLVED (Unanimously)

- 1. That delegated authority be given to the Chief Finance Officer, in consultation with the Leader, to acquire Property A for the agreed costs in the report.**
- 2. To agree to purchase the long lease of Property B for the agreed costs in the report.**

Reasons for the decision

The purchase of Property A provides an opportunity to secure a significant site in a prime location. This would help secure the long term economic development of Hastings and St Leonards, protect business rate income for the future, along with the potential to develop the site further, whilst also securing an income stream to help provide services within the borough.

With regards to Property B, the Council already owns the freehold and has the potential to acquire the leasehold interest. The site is a prime location within Hastings.

The Council needs to ensure that key areas remains attractive for the future to ensure businesses are attracted to, and remain in, Hastings – particularly so as the Council will need to ensure business rate growth in the future.

Both properties provide the Council with the opportunity to diversify its property holdings and change the overall risk exposure within the portfolio. The Council would also secure additional income streams.

(The Chair declared the meeting closed at. 6.26 pm)

Agenda Item 4



Report to: Cabinet

Date of Meeting: 18 December 2019

Report Title: Harold Place Development Proposals

Report By: Peter Grace
Assistant Director Financial Services and Revenues
(Chief Finance Officer)

Purpose of Report

To consider two proposals received for the future redevelopment of this important site in the town centre. One involves the Council developing the site itself the other involves the disposal of the site on a very long lease to a developer who would design, build and manage the development for possible occupation by the same company.

Recommendation

- 1. Cabinet agree to redevelop the site for a restaurant operation (excluding fit out) for a cost of up to £1.2m, subject to planning permission and an agreement to take the finished property on a long lease, from the preferred bidder (Option 1 in the report) on the terms outlined. The £1.2m figure to be included within the Capital programme.**

Reasons for Recommendations

The Council has marketed the site, has received acceptable heads of terms for a long lease from a relatively well known and quality restaurant if the Council builds out the site to provide a building with a minimum of 2,200 square feet of accommodation.

The Council has previously looked at options for straight disposal of the site for numerous uses ranging from a restaurant, offices to a small hotel.

The creation of a restaurant type offering would appear to be most financially viable proposal received and one which can provide further employment opportunities within the town as well as regenerating the area concerned.

The retention of the ownership of the site and development by the Council would help ensure that the building would be built to a high quality and design and that there is a greater input on the future use of the site

The Redevelopment Site

1. The Harold place site is very prominent, is a standalone building, and will set the tone for anyone entering the town from the seafront direction and visually from the main road. The ability to create a quality offering at a key location could transform the space from one which is under used for such a prominent location.
2. In March 2018 the Council agreed to demolish the building in the absence of a viable and attractive development proposal. A subsequent Coastal Communities funding bid was unsuccessful which if successful could have provided some funding for the redevelopment of the site. The site has continued to be marketed through Dyer and Hobbs who continue to work as the Council's agents.
3. A formal expressions of interest in taking on a long lease should the Council develop the site out itself has now been received directly from an agent working for the same well known restaurant operator who had previously expressed an interest in the site in 2018 but were unable to commit at that time.
4. A second expression of interest has been received from a developer seeking to provide a similar level of restaurant accommodation as well as two apartments on the site. Preliminary proposals for a building of modern design have been received.
5. If the Council decides that neither of the two proposals received are acceptable it will need to again consider the future of the site. The costs of simply providing a safe surface and minimal street furniture are considerable (potentially £150,000 to £200,000) and once more appropriate landscaping costs or temporary use structures are incorporated the costs escalate further.
6. Given that the Council is seeking to continue, within its limited resources, the regeneration of the town and make it a more attractive place to live and work, as well as generate additional income, either of the two options seem attractive.
7. The option for the Council to redevelop the site itself incurs potentially more costs if there are additional unforeseen costs, but would retain more control in terms of what is built than if disposed of by long lease. However the Council does not have an off the shelf design, it would need to tender for the design and build and a project architect. The costs of doing so provide additional uncertainty into the cost projections
8. A disposal to a third party has some advantages in that it removes a some of risks, e.g. reduced Council staff requirements, the gaining of planning permission, and possibly fewer procurement issues and costs.

Option 1

9. Cabinet agree to redevelop the site for a restaurant operation for a cost that is estimated at some £1.052m, and is the subject of planning permission and an agreement to take the finished property on a long lease, from the preferred bidder. This would be for a shell building (not fitted out). The bidder would be responsible for the fit out costs – estimated at some £800k.
10. The Council would fund the building itself through prudential borrowing on what would be a 15 year lease at a rental of not less than £60,000 p.a. this represents a yield of around 5.7% gross on £1.052m.
11. If developing the site itself (following an agreement to lease) the Council would incur the borrowing costs over the design and construction phases which would not be recoverable. These are estimated to amount to some £80,000 and would fall in 20/21 & 21/22 when the Council has a significant budget deficit to tackle. In addition given the uncertainty on tender prices then a contingency should be allowed for should design and construction costs be higher for a more iconic quality building – hence a programme budget is recommended of £1.2m. This would also include a small contingency (£10,000) should there be a need to acquire additional planning capacity within the Council for what is expected to be a priority project, given the key location in the town.
12. At an overall programme cost of £1.2m, borrowing the money at an interest rate of some 3.2% (annuity loan) over 40 years would result in a reduced surplus of some £6,600 p.a.
13. The key points on the heads of terms are:
 - 15 year lease with break clause at 10 years, and 5 year rent review
 - Full repairing and insuring lease
 - Rent free period – 6 months rent & 12 months cash
 - Subject to planning and licensing

Option 2

14. An expression of interest has been received from a developer seeking to provide a similar level of restaurant accommodation as well as two apartments on the site.
15. The preliminary proposals received are for a building of modern design. The Cabinet would need to agree to lease the site for a period of 200 years for a 10% return on rentals received.

The Council has no initial outlay. The offer from the developer would be subject to planning and licensing consents. Based on the assumption that the ultimate tenant would be the same company, then a 10% return would be a more risk free £6,000 p.a. plus business rate income assessed at some £11,000 p.a.

The above is being offered subject to contract, planning, licensing and Board approval.

16. Timescales

The timescales remain dependent upon the receipt of planning permission and the receipt of tenders. The use of a procurement framework agreement may reduce the timescales involved. No project plan has yet been produced; however a 12 to 18 month project timescale should be expected once planning permission is granted.

17. Other Options

In the event that the existing interested parties cease to be interested or the heads of terms (already agreed) are not actually signed prior to the commencement of build, the council has a number of other options:

Option 3

Continue to develop the site itself – the capital expenditure is then at some risk if a tenant can-not be secured. Borrowing costs could be between £46,000 and £80,000 per annum depending upon whether a full fit out was to undertaken. This option provides an opportunity for revenue generation, as well as regeneration of a site that has been problematic in recent years with antisocial behaviour.

Option 4

Landscape the site – and landscape either permanently or with a view to develop in the longer term. More robust costings need to be investigated should the proposals received not be considered attractive or affordable.

Option 5

Mothball the site whilst seeking external funding for redevelopment. There would continue to be costs for hoardings, inspection, and maintenance.

Risk Management

18. The interested party has a business that appears to be successful in what has been a difficult trading period for some restaurant/Café operators. The financial



results of the business would indicate that it has sound financial management practices in place.

19. There is nothing to currently suggest that the interested party will not wish to complete an agreement for lease – consequent on the Council developing the site. Likewise the developer submission would be subject to an agreement with a tenant in place.
20. The costs included in this report are estimates and would be subject to full tender – save where competitive quotes have been obtained.
21. The potential determination of an extension to current conservation areas could potentially increase costs and timescales.

Financial Implications

22. This property development would fit well with the regeneration and economic development aspirations for the town and generate additional employment opportunities as well as income for the Council in the long term
23. The initial returns achieved would be below those currently being achieved for commercial property purchases, but these proposals would save the Council from significant additional expenditure and additional landscaping work.
24. The proposal from the developer has significantly less risk to the Council, is likely to be achieved rapidly and with fewer implications for Council resourcing and less budgetary impact at a time of acute funding shortage. However the involvement of the Council in the design and construction of any building on such an important site is considered to be a high priority – not only for when initially built also for determining future use.

Legal Powers

25. The Council has powers under the Localism Act and general power of competence to undertake such projects and Section 123 of the Local Government Act 1972 for the disposal of land.

Environmental /Climate Change Issues

26. Planning Policy SC3 states that all new development must be designed to incorporate appropriate climate change mitigation and adaptation measures such as green roofs and walls, sustainable drainage systems, multi-functional green space, protecting and enhancing biodiversity, waste reduction and recycling facilities, water efficiency, flood risk management, and the use of recycled materials in new development.

Should the development include apartments the Council has planning requirements for all new residential developments in respect of renewable energy and green design.

Local Peoples Views

Any planning application for this key site within the town centre will require public consultation.

Policy Implications

Please identify if this report contains any implications for the following:

Equalities and Community Cohesiveness	No
Crime and Fear of Crime (Section 17)	No
Risk Management	Yes
Environmental Issues	Yes
Economic/Financial Implications	Yes
Human Rights Act	No
Organisational Consequences	No
Local People's Views	yes
Anti-Poverty	No

Additional Information

Cabinet Report – March 2018

Officer to Contact

Peter Grace
pgrace@hastings.gov.uk

Agenda Item 8

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A
of the Local Government Act 1972.

Document is Restricted

This page is intentionally left blank

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A
of the Local Government Act 1972.

Document is Restricted

This page is intentionally left blank

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A
of the Local Government Act 1972.

Document is Restricted

This page is intentionally left blank

Public Document Pack

Cabinet Agenda

Monday, 6 January 2020 at 6.00 pm

Council Chamber, Muriel Matters House, Breeds Place, Hastings, East Sussex, TN34 3UY

If you are attending Muriel Matters House for this meeting, please enter the building via the Tourist Information Centre entrance.

For further information, please contact Democratic Services on 01424 451484 or email: democraticservices@hastings.gov.uk

	Page No.
1. Apologies for Absence	
2. Declaration of Interests	
3. Minutes of Last Meeting <i>Minutes from the meeting held on 18th December will be approved at the 3rd February meeting</i>	
4. Bohemia leisure and cultural facilities study <i>(Simon Hubbard, Director of Operational Services)</i> <i>(Cabinet decision)</i>	1 - 48
5. Treasury Management - Mid-Year Report 2019-20 <i>(Peter Grace, Assistant Director Financial Services and Revenues)</i> <i>(Cabinet decision)</i>	49 - 70
6. Town Deal <i>(Victoria Conheady, Assistant Director Regeneration and Culture)</i> <i>(Cabinet decision)</i>	71 - 78
7. Buckshole Reservoir <i>(Mike Hepworth, Assistant Director Environment & Place)</i> <i>(Cabinet decision)</i>	79 - 228
8. Notification of Additional Urgent Items	
9. Urgent Items (if any)	

This page is intentionally left blank

Agenda Item 4



Report to: Cabinet

Date of Meeting: 6th January 2020

Report Title: Bohemia leisure and cultural facilities study

Report By: Simon Hubbard
Director, Operational Services

Purpose of Report

To update cabinet on the Bohemia leisure and cultural facilities options appraisal study and to recommend next steps in progressing the scheme

Recommendation(s)

- 1 To agree in principle to provide a new leisure centre and leisure water, and primary entertainment centre on the Bohemia site, significantly improving on the town's current leisure and cultural offer, with provision for adding an arts centre if capital and revenue funding can be obtained
- 2 £100 000 be set aside to commission detailed site and topographical surveys of the land, to inform and de-risk the next stage of the work; £35 000 to come from existing budgets, £65 000 to be a 'growth item' funded from general reserves
- 3 A report be brought back to cabinet in autumn 2020 reporting on the outcome of the site surveys, recommending a location for the new leisure and entertainment centre, with provision for an arts centre, which would also take into account the potential value of investing in housing elsewhere on the site. This would consider alternative models for financing the work, and include a funding/partnership/investment strategy.

Reasons for Recommendations

To ensure that the project can be taken forward in a sensible, cost-effective way.

Introduction

1. At its meeting on 4th March 2019 cabinet agreed to spend up to £100k to fund the commissioning of an initial options appraisal to consider the development of new leisure and culture centres and associated outdoor spaces within the Bohemia area (£10k of this came from Arts Council England, and the remaining up to £90k required would be funded through existing budgets and an approved ‘growth item’ of up to £19k). A consortium of consultants, led by Continuum and FEI ('Continuum') were the successful tenderers, and they started work in June. Their initial tender was for £78 120, but additional work on cultural options, and land valuations, has cost £4 300, bringing total spend to date to £82 420.
2. A considerable amount of work has now been done by the consultants, and regular meetings held with HBC’s project team and other senior managers; they have also met with lead councillors on a number of occasions. Alongside this, substantial consultation and engagement with stakeholders has taken place. This has included the leisure and cultural sectors locally, and sports national governing bodies, operators and local authority neighbours.
3. Continuum have produced their final strategic report, which is included as Appendix 1. It does contain confidential and commercially sensitive information, and so small parts have had to be redacted, but in the interests of transparency it is felt that it is better to publish a redacted version rather than withhold the report completely.
4. Continuum’s primary aim was to look at how the council could generate a critical mass of activity that is deliverable and distinctive whilst at the same time creating a high quality cultural and leisure destination with a strong sense of place and good connections with the wider area.
5. Continuum believe that whilst there are challenges, the potential future development of the Bohemia area in Hastings and the options to develop new leisure and cultural facilities and venues represents a very real and exciting opportunity for Hastings.

Discussion

6. As can be seen from the report, five options have been identified; the net present value ('NPV' - the difference between the present value of cash inflows and the present value of cash outflows over a period of time, and accounts for the time value of money) :-

Option A	Patch up, indicative capital cost £25.3m, NPV £24.9m
Option B	Direct replacement of current leisure and primary entertainment centre (theatre), indicative capital cost £56.9m, NPV £24.6m
Option C	Enhanced leisure and leisure waters, primary entertainment centre, indicative capital cost £71.6m, NPV £32.6m
Option D	Enhanced leisure, primary entertainment and arts centre, indicative capital cost £77.9m, NPV £41.2m
Option E	Enhanced leisure, waterpark, entertainment and arts venue, indicative capital cost £88.2m, NPV £50.3m

The ‘Net Present Value’ (NPV) figure is based on a 25 year financial projection, no inflation and takes revenue costs and income into account

7. It should particularly be noted that the direct replacement is actually cheaper over 25 years than the patch up option, because maintenance costs continue to rise if the existing buildings are continually repaired, and ongoing subsidy would be required.
8. However, it is our view that we should aspire to more than this. An improved leisure and cultural offer will deliver transformational change to the Bohemia area and, indeed, the whole town. Investing c£57m for what is effectively a like for like replacement does not help us realise this ambition. A like for like offer will leave us falling further behind other towns, as they continue to develop their economy through developing their leisure and cultural offer. We aspire for our new leisure and cultural centre to be a destination in its own right, popular with the local community as well as being able to attract visitors, something the town can be proud of.
9. Option C provides an enhanced leisure centre, enhanced outdoor facilities and a new entertainment centre, and option D provides the additional arts centre to complement the entertainment centre, with the same facility mix as option C.
10. It should be noted that option D meets all of the consultation aspirations for both leisure and culture, and is a very close match to meeting all aspects of the original brief. There was strong support from the local cultural community for an arts centre, which would provide a different offer to the commercial entertainment centre, although it was acknowledged from the outset that this would be significantly more expensive to build and to operate, almost certainly requiring ongoing funding.
11. This is a rare and exciting opportunity to significantly improve Hastings leisure and cultural offer. Finance colleagues have been involved in the development of these options and the current financial pressures are well known and understood. In particular it is acknowledged that the additional capital cost and ongoing revenue contribution required for the arts centre are difficult to countenance at present without additional external investment.
12. Continuum believe new enhanced leisure and cultural facilities would bring the following benefits:
 - Increase opportunities for local residents and visitors to participate in leisure and cultural activities with new high quality integrated leisure and cultural facilities
 - Secure a long-term future for sport and culture within Hastings and raising the profile of Hastings as an attractive place to live, work and visit.
 - Financially viable facilities that generate an operating surplus and do not require a subsidy from the council.
 - More energy efficient and environmentally friendly facilities with a reduced carbon footprint, which aligns with the council’s climate emergency position of being carbon neutral by 2030.
13. Our preferred approach is therefore to progress with option C i.e. enhanced leisure centre and leisure water, and primary entertainment centre, with provision for

adding an arts centre at a later stage if necessary when capital and revenue funding can be obtained. This supports Continuum's recommendation based on the Treasury's 'Green book' business case evaluation methodology. It is proposed that we raise the level of interest and support in the cultural offer as soon as the current budget process is finalised, to improve the chances of obtaining funding to secure the arts centre.

Proposed next steps

14. It is acknowledged that the 'at risk' revenue costs of developing detailed plans to planning application stage are considerable.
15. Before detailed site and building design work can start, site, service, and topographical, geotechnical and contamination surveys are required to confirm the viability for locating the leisure and cultural centres. It is in some respects a tricky site, hilly and dropping steeply at its southern end, crossed by a relatively shallow railway tunnel; it is lacking accurate service information, such as that regarding utilities and sewers.
16. It is therefore recommended that detailed site, service and topographical surveys be commissioned for the whole of the Bohemia site (excluding the Travelodge site, which will be undertaken by the hotel owners), which are likely to cost around £100 000.
17. This helps 'de-risk' the project before more substantial sums are invested in detailed design work, and will make any development here a more attractive proposition for investors/partners. Once completed, a report should be brought back to cabinet detailing the results and a proposed way forward recommended. As noted above this is felt to be option C at this stage, i.e. enhanced leisure and leisure waters, and primary entertainment centre, but with the option of adding an arts centre if capital and revenue funding can be obtained.
18. The promotion of the scheme outlined in the consultants' report marks the beginning of a campaign to win support for a development of this scale.

Timescales

19. Ordinarily the commissioning and executing of these surveys would be expected to take 4 – 6 months. However, given the organisational changes expected shortly, which may impact upon the team expected to project manage/deliver this work, it is more realistic to expect the work to be completed within nine months. A report to cabinet could therefore be expected in autumn 2020. Commissioning a team of engineers and architects to develop detailed plans would take until early 2021, meaning that any significant architects' and engineers' fees would not be incurred until the 2021/22 financial year.
20. A masterplan study to understand the relationship between residential development and the leisure and cultural centres is recommended if work progresses further, with a coordinated approach to transport, movement, energy, servicing and waste management to deliver a high quality development and public realm. This could form part of the investment plan work for the Town Deal, which officer will be progressing during 2020 and beyond, subject to Cabinet approval.

21. Subject to planning permission being obtained, work could start on site in late 2024, with completion by 2026.

Finance

22. The capital and NPV costs of the scheme are summarised above and detailed in the appended report; the enhanced leisure, leisure water centre and primary entertainment centre has an indicative capital cost of £71.6m and NPV of £32.6m. Adding an arts centre gives an indicative capital cost of £77.9m, and an NPV of £41.2m.
23. As suggested above, the site survey, etc., work is likely to cost around £100 000, and this would be undertaken before detailed planning and engineering work started.
24. The existing Summerfields leisure centre site can be redeveloped for housing once the new leisure centre is open. The future of the White Rock Theatre building will be considered as part of the wider masterplanning of the area referred to above.
25. The value of the Bohemia land available for housing is dependent on the site chosen for the leisure and cultural centre; this in turn will be informed by the site and topographical survey. Land values – and the cost of construction – change over time, and the addition of a new leisure and cultural centre would be expected to increase land values, as noted above.
26. It is therefore recommended that further work is undertaken on the viability of the various site options, and the value that can be generated from them, once the topographical/survey work has been undertaken.
27. It is also recommended that, over the coming months, and in parallel with the site work, alternative models for financing the new facilities are thoroughly explored, and that a funding/partnership/investment strategy is developed, likely forming part of the Town Deal Investment Plan work being developed by council officers, as mentioned previously above.

Recommendations

- 1 To agree in principle to provide a new leisure centre and leisure water, and primary entertainment centre on the Bohemia site, significantly improving on the town's current leisure and cultural offer, with provision for adding an arts centre if capital and revenue funding can be obtained
- 2 £100 000 be set aside to commission detailed site and topographical surveys of the land, to inform and de-risk the next stage of the work; £35 000 to come from existing budgets, £65 000 to be a 'growth item' funded from general reserves
- 3 A report be brought back to cabinet in Autumn 2020 reporting on the outcome of the site surveys, recommending a location for the new leisure and entertainment centre, with provision for an arts centre, which would also take into account the potential value of investing in housing elsewhere on the site. This would

consider alternative models for financing the work, and include a funding/partnership/investment strategy.

Timetable of Next Steps

28. Please include a list of key actions and the scheduled dates for these:

Action	Key milestone	Due date (provisional)	Responsible
Site surveys commissioned	Action completed	January 2020	Kevin Boorman
Site surveys completed	Action completed	August 2020	Kevin Boorman
Finance models developed	Action completed	August 2020	Kevin Boorman
Funding/partnership/investment strategy developed	Action completed	August 2020	Kevin Boorman
Cabinet paper recommending next steps	Action completed	Autumn 2020	Kevin Boorman

Wards Affected

All

Implications

Please identify if this report contains any implications for the following:

Equalities and Community Cohesiveness

The new leisure and cultural centres have the potential to increase participation and create a new destination for the community

Crime and Fear of Crime (Section 17)

n/a

Risk Management

As per the project management tools a risk log is being maintained

Environmental Issues

Report Template v29.0

Undertaking site and topographical surveys as per the recommendations will help to inform and de-risk the project

Climate Change

The indicative costs for the buildings take count of the need to meet high 'BREEAM' standards, and for the buildings to be sustainably built and operated, including the use of heat pumps where applicable

Economic/Financial Implications

Requirement for funding to undertake the site and topographical surveys as per the recommendations. Further implications will become clearer as the project is developed in more detail.

The new leisure and cultural centres have the potential to generate income for the council and contribute to the wider economic growth and regeneration of the town

Human Rights Act

n/a

Organisational Consequences

n/a

Local People's Views

Local stakeholders were consulted with as part of the options appraisal study process.

Anti-Poverty

n/a

Additional Information

Appendix 1: Bohemia Masterplan – Sport and Culture – strategic report

Officer to Contact

Kevin Boorman

KBoorman@hastings.gov.uk

01424 451123

This page is intentionally left blank



FAULKNERBROWNS
ARCHITECTS

Aedas
Arts Team



Bohemia Masterplan – Leisure and Culture

Strategic Report , 9th December 2019

CONTENTS

1:	Introduction	2
2:	Scope of the Study	3
3:	Methodology and Approach	6
4:	Strategic Context	8
5:	Consultation	10
6:	Development Options Overview	15
7:	Outline Business Case and Evaluation Section	20
8:	Summary	39

Appendices:

Appendix 1	Capital Cost Estimates
Appendix 2	Valuation Estimates
Appendix 3	Business Planning Assumptions
Appendix 4	Outline Specification for Leisure

1. Introduction

In June 2019, Continuum Sport and Leisure (Continuum) and Festivals and International Events (FEI) were commissioned by Hastings Borough Council (the Council) to undertake an options appraisal study for leisure and cultural facilities as part of the Bohemia masterplan. The Council were keen to be armed with detailed and robust information to help inform their planning and decision making in relation to any potential future developments of leisure and cultural facilities within the Bohemia area. In May 2019, ahead of commissioning the study and circulating the subsequent brief, the Council had set out the need for both the recognition of the importance of Bohemia and the need to undertake more detailed research into the opportunities and costs associated with any development of the study site to Cabinet. In order to explore the feasibility of developing the site, identify options that are available, highlight the demand for facilities, illustrate the impact that they can have in the local area and explore the potential financial issues and opportunities that are associated with any scheme, the Consultant Team have undertaken a detailed review process to assist the Council with their decision making regarding the long-term future of the leisure and cultural facilities.

The focus of the study has been to investigate the most effective and efficient potential redevelopment options for Summerfields Leisure Centre, White Rock Theatre and the outdoor leisure and recreation facilities in Bohemia.

This strategic report sets out the options appraisal with the focus on the financial analysis and business planning in order to assist the Bohemia Project Team in assessing the potential financial impact of any proposed investment.

It should be noted that since the commission in June 2019 there have been some notable changes in a number of internal and external factors.

Internally, the Council has had further budget reviews and key financial challenges for projected future budgets. Externally the Treasury Announcement in October 2019 means there is a rise in the interest rates for the Public Loans Works Board. The Council are however committed to the future regeneration and development of this important project.

Whilst challenges remain, the potential future development of the Bohemia area in Hastings and the options to develop new leisure and cultural facilities and venues represents a very real and exciting opportunity for Hastings.

In the current climate of financial and political uncertainty, the Consultant Team are confident that with strong leadership and robust long-term, non-partisan decision making focused on working towards further technical and financial certainty, the redevelopment of leisure and cultural facilities can have a lasting positive impact on the town.

2. Scope of the Study

2.1 Context

The Council have to date devoted notable effort and resources into developing the Bohemia project to be placed as the heartbeat of regeneration within the town. This study's priority aim is to "*generate a critical mass of activity that is deliverable and distinctive whilst at the same time, creating a high quality cultural and leisure destination with a strong sense of place and good connections with the wider area.*" The study highlights two key areas for development, which are the leisure and cultural offer. The Council have outlined the desired outcomes they want to achieve regarding the leisure offer, which are:

- Improved and rationalised outdoor sports facilities
- To generate income and minimise public subsidy
- Increased appeal and enhanced access for a wider range of users, reaching out to local communities particularly inactive residents and disadvantaged groups
- Positive impact on health and wellbeing outcomes and increased participation in sport and physical activity
- 'Top end' product to provide enhanced tourism and regional offer, including its perception as a wet weather attraction
- Evidence based programming

With regard to the cultural offer for Bohemia, the study scope sets out that the White Rock theatre is considered an outdated theatre that is unfit for purpose and does not meet the aspirations of the Council. The Council stated that it would like a building that meets the following needs:

- A presenting theatre which provides exciting, magical and inspiring experiences for everyone
- A theatre which has a strong emphasis on quality in everything that it does

- A theatre which presents a diverse professional programme, and which actively supports and encourages local performers
- A home for amateur groups to present their work to local audiences
- A theatre which delivers an active community, education and outreach programme, developing participation and audiences, particularly in the most deprived areas of the town
- A theatre which actively collaborates with other cultural partners, including subsidized organisations looking for residency opportunities
- A theatre which has the design and size to do all of the above

The scope of the study sets the clear aspirations the Council has for the study site to become the heartbeat of the town's regeneration, bringing forward an underutilised area into a place for people to work, live and visit. During this project we have constantly reviewed and revisited this brief to ensure the overall approach and emerging recommendations remain aligned with the Council's vision for Bohemia.

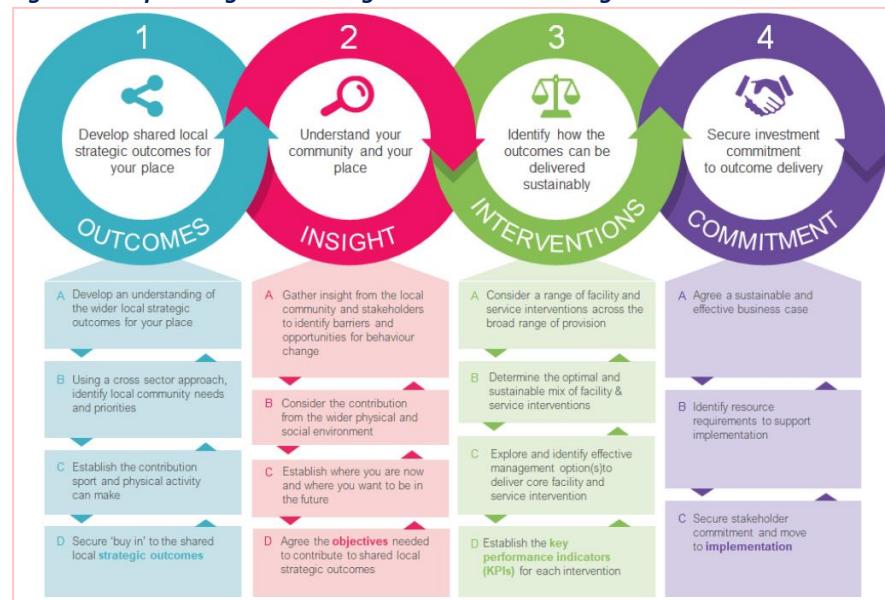
2.2 Sport England Strategic Outcomes Planning Guidance

The brief has also been shaped and influenced by the recent Sport England guidance on Strategic Outcomes with the Council keen to ensure that the study focuses on the need to ensure a clear evidence base and a strategic approach to developing community facilities. Whilst the model has been developed by Sport England with the focus on facilities for sport and physical activity, it can be equally applied to the development of cultural facilities and the important and positive impact that they can and do have on the wellbeing and the attractiveness of an area and its communities.

The Sport England guidance is summarised in the diagram below. The model describes the stages and approach needed to ensure investment best meets local strategic outcomes and the needs of the community, but importantly recognises the challenges faced in terms of resourcing and developing large-scale capital projects. The guidance clearly states

that projects need to be achievable and sustainable which, as detailed within this strategic report, has remained at the forefront of our thinking when discussing the facilities and options on our study site.

Figure 2.1: Sport England Strategic Outcomes Planning Guidance



This brief and the delivery of this options appraisal cover Stages 2 and 3 of the Sport England model. The Council have set the outcomes associated with the study and have invested notable time and resources into assessing the wider needs of the town and its population through its various key strategies and policies. The Consultant Team have identified the leading strategic objectives and set out how the proposed interventions will have the greatest impact on the leading objectives. By considering a range of facility and service interventions across the broad range of provision, completing Stage 3 will identify the optimal and sustainable mix of facility and service intervention. This will

enable the Bohemia Project Team to work towards a future commitment that is deliverable and will ensure significant improvements and benefits for the town.

2.3 DCMS and ACE Strategic Framework for Culture

The national context for the Culture and Creative Economy is set out by the DCMS and Arts Council England. The Culture White Paper (DCMS 2016) makes the case for culture's important role in place-making, in driving economic growth, in talent and skills development and in promoting Brand Britain. It also makes a pledge that everyone should have the opportunity to enjoy the opportunities culture offers at all stages of their lives and for wherever they live. Arts Council England's Draft Strategy for 2020-2030 is to enable more people to take advantage of more opportunities to develop and express their creativity, to support them to access the widest possible range of high-quality culture, and ultimately to help create a country in which creativity and culture enrich the lives of every one of us.

2.4 Study Site

The overall study site has multiple users and user groups located there with both formal and informal arrangements in place. There are a number of formal arrangements in the form of leases that are currently in place on the study site.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

3. Methodology and Approach

To ensure the development of a detailed and robust options appraisal and associated recommendations, the Consultant Team deployed a multi-stage methodology that sought to meet both the needs of the Council brief as well as follow the Sport England guidance. An overview of the approach is set out within this section.

3.1 Desk Based Review

A significant amount of research, statistical information and strategic documentation has been analysed and reviewed by the Consultant Team during this project. This information has provided background data and context about the population and demographic make-up, current participation trends and the existing supply of leisure and cultural facilities within Hastings and neighbouring areas. This background research also includes the review of strategies and action plans that have been published by a range of national, county-wide and local bodies and organisations. It has been undertaken as a way of highlighting the strategic relevance of our study site to a wide range of partners and stakeholders. Information has also been provided by the centre's operator Freedom Leisure and the theatre's operator HQ Theatres relating to the current and historical management of the buildings. This data has been reviewed, analysed and used to inform the consultation sessions as well as the facility mix and financial options for the site. A summary of the key strategies and policies is provided in Section 4 of this strategic report to indicate the breadth of support and alignment to key strategic documents and policies, which will both influence and be influenced by the future development of the facilities.

3.2 Consultation with Key Stakeholders

A key part of this study has been a detailed consultation process with key partners and stakeholders. The Consultant Team were keen to ensure that this process sought the views of a wide range of individuals and organisations. The Consultant Team undertook several face-to-face and telephone interviews with key stakeholders. These interviews centred around standardised and bespoke questions for each of the consultees in order to gain their insight and opinions on the Bohemia development and the potential development of facilities at the site.

In order to gain the views and opinions of a wider range of partners and potential users of the facilities at the leisure centre, the Consultant Team also developed an online community club survey which was sent to a number of locally based sports clubs/organisations.

Additionally, the Consultant Team undertook two sector specific workshops to engage a number of wider stakeholders in the process. In August 2019, FEI invited the leading stakeholders of the Hastings cultural scene to discuss the facility mix and demand within the town to help understand the local opinion. In September 2019, Continuum held a sports and leisure workshop which helped to gain insight into the local population's view on the leisure facilities currently available in the town.

The findings of the consultation process and the responses to the online questionnaires have been analysed and are also incorporated into the consultation findings. An overview of the partners consulted, and key outcomes are provided in Section 5 of this report.

3.3 Concept Designs, Options Appraisal, Business Case and Affordability

Following the detailed analysis of the findings from the consultation process the Consultant Team identified a number of options, working closely with the Bohemia Project Team. Additionally, these were then subject to concept designs and indicative cost planning exercises.

Continuum has worked within the Consultant Team to develop a range of potential development options for the Council to consider for Bohemia. As a result of this process, a number of initial concept designs and spatial plans have been prepared to illustrate the different options for the site. Cost Consultants have also been an integral part of the Consultant Team and have prepared the outline, indicative capital costs for each of the options presented. Following on from this, the Consultant Team has undertaken an options appraisal for the study site. A key element of the options appraisal exercise that has been undertaken is the development of outline business plans illustrating the associated revenue implications for each of the options. The options are then subject to qualitative and quantitative financial analysis to present a series of initial recommendations and provide the Council with a range of options to discuss and agree a way forward for the site.

3.4 Client and Council Member Review

Throughout the study the Consultant Team have presented the key findings at specific milestones with the Bohemia Project Team, the Bohemia Project Board (responsible for overseeing all development within the Bohemia Area) and with lead members for Regeneration, Culture and Tourism, Housing, Leisure and Community Engagement and the Leader of the Council. Key findings and emerging priorities have been relayed and debated within these different forums and feedback and direction from the Council has been sought throughout these stages. The Consultant Team have ensured that each key milestone has been developed in partnership within these forums to ensure a truly shared and owned options appraisal study.

4. Strategic Context

An integral part of the review process for the study has been the review and analysis of key strategic documents at a national, regional and local level to assess how the overall potential development for leisure and culture can meet the wider strategic needs of national, regional and local policy for Hastings. Any proposed development set out in the study aims to redevelop leisure and cultural facilities on the study site to serve market demand and strategic need across Hastings. As such, it will contribute to the delivery of a wide range of strategies covering health and wellbeing, physical activity, tourism and visitor economy, skills, employment and education, regeneration and growth in a priority area both for Hastings and on a national scale.

The strategies reviewed within the overall study include:

4.1 At the national level:

- DCMS - Sporting Future: A new strategy for an Active Nation (2015)
- Sport England - Towards an Active Nation (2016)
- Public Health England - Everybody Active, Everyday (2014)
- DCMS - Cultural White Paper (2016)
- Arts Council England - Shaping the Next Ten Years (2019)

4.2 At an East Sussex region level:

- Active Sussex Strategy (2018-2023)
- East Sussex Cultural Strategy (2013-2023)
- Children and Young People's Emotional Health and Well Being Local Transformation Plan (2015-2020)
- East Sussex Growth Strategy (2014-2020)
- East Sussex Strategic Partnership - Health and Wellbeing Strategy (2016-2019)
- East Sussex County Council - One Council Property Asset Management Plan (2013-18)
- East Sussex County Council - Council Plan (2019/20)

- East Sussex County Council - Local Transport Plan (2016/17-2020/21)
- East Sussex Joint Need Assessment - Focus on East Sussex (2018)
- Skills East Sussex – Activity Plan (2017-20)

4.3 At the local borough level:

- Hastings and St Leonard's Play Space Strategy (2015-2017)
- Hastings Local Football Facility Plan (May 2019)
- Hastings and Rother Playing Pitch Strategy (2016)
- Hastings Leisure Facilities Strategy 2009-2020 (2015 Refresh)
- Hastings Borough Council - Seafront Strategy (2015)
- Culture-Led Regeneration Strategy (2016-2021): A Strategy for Hastings
- Hastings and Rother Clinical Commissioning group – Local Need and Assets Profile (2016)
- Destination Hastings – Future High Street Vision
- Hastings Town Centre and Bohemia Area Action Plan (July 2018)
- Department for Education - Hastings Opportunity Area 2017-2020 (Social mobility)
- White Rock and Bohemia: A Strategy for the future of the White Rock Area, Hastings (July 2017)
- Hastings Planning Strategy Plan: The Hastings Local Plan 2011-2028
- Hastings Corporate Plan (2019/20)

As part of the overall study, this wide range of strategies, policies and plans have been examined. Relevant key messages have been taken from each document along with key outcomes and actions which the proposed facility developments can support. This process helps to demonstrate that plans for the development of new facilities for leisure and culture within Bohemia are of strategic relevance to a wide range of groups and organisations. This will help to ensure that they are well-used, benefit a wide range of community users and potentially attract investment from partner organisations.

Whilst any decisions regarding the potential redevelopment of a new leisure centre, facilities and a cultural venue for Hastings will be governed by financial viability and affordability, the wider community benefit and the ability of the site to play an increased role in helping the Council meet aspirations across a wide range of agendas should not be overlooked. Investment into community facilities will support the Council's work against their own corporate aims and ambitions and also provide the regeneration of a key area that can have a lasting, long-term impact on strategic objectives. It is important for the Council to continue to engage the various key partners and organisations to ensure a continued strategic alignment with appropriate objectives.

The wider value of participation in leisure and culture is recognised across a range of policy areas, including health, crime, education, employment and regeneration. Bohemia already accommodates strategically important facilities within Hastings, and it is essential to ensure that it can continue to support the work of a range of local and national partners. The study site has the potential to support a sustained increase in leisure and culture and the arts for local people. Engaging a wide range of partner organisations that can potentially support aspects of the capital development, as well as the delivery of quality opportunities, will be of great benefit to the leisure and cultural landscape.

5. Consultation

Consultation has been at the heart of this options appraisal and master planning process and has assisted in shaping the overall development planning for both leisure and culture. The Council recognise the importance of engaging with various partners across both sectors as part of the overall approach to the study.

The process has involved a large number of individuals and stakeholders from Hastings Borough Council, East Sussex County Council, Theatre and Leisure Centre operators, National Governing Bodies of Sport, the community clubs on site, other local stakeholder groups and members of the local community.

The Consultant Team have been engaging with key stakeholders throughout the process, undertaking the following:

- Stakeholder workshops with the council members.
- Stakeholder workshops with the leading community sports clubs and cultural groups within Hastings.
- Survey of the leading community sports clubs to gauge demand of facilities.
- Consultation with National Governing Bodies on funding, facility development and the supply and demand in Hastings.
- Consultation with key stakeholders and partners for sport and culture both internal and external to the Council and planning, economic development, leisure, tourism, estates and regeneration within the Council.

5.1 Tier One Consultation

This stage of consultation was completed mainly via face to face interviews and included major stakeholders involved in this project. This tier of consultation enabled the Consultant Team to get a clearer picture of Hastings, the project and ensure a good understanding of where it is

placed within Hastings priorities. These leading influential stakeholders included the following:

- Hastings Borough Council Regeneration Team
- Hastings Borough Council Major Projects Team
- Hastings Borough Council Planning Team
- Hastings Borough Council Estates Team
- Hastings Borough Council Finance Team
- Hastings Borough Council Museum and Cultural Team
- Hastings Borough Council Leisure Team
- Hastings Borough Council Economic Development Team
- Hastings Borough Council Housing, Leisure and Community Engagement Portfolio Holder
- Hastings Borough Council Deputy Leader of the Council and Regeneration, Culture and Tourism
- Sport England
- Arts Council England
- Freedom Leisure
- HQ Theatres
- East Sussex County Council Transport and Highways Team
- East Sussex County Council Director of Public Health
- East Sussex County Council Economic Development Team
- East Sussex County Council Education and Employability Team
- East Sussex County Council Cultural Team
- Hastings and Rother CCG Health Inequalities Programme Manager

Key Findings

We have highlighted the key findings that represent the balance of views we found during our tier one consultation below:

- Strategically important site and considered very important for the regeneration of the town. The leading aspirations of the Council were noted that the priority was to deliver new facilities and not refurbish the current provision.

5.2 Tier Two Consultation

This stage of consultation was completed via telephone and included partners interested in and affected by this project. This tier of

consultation was to enable us to get a clearer picture of Hastings and the surrounding areas to ensure alignment to wider strategic objectives and environment of the town. This tier of consultation included the following stakeholders:

- Active Sussex
 - East Sussex College
 - Rother District Council Leisure Team
 - Wave Leisure (Eastbourne)
 - Hastings and Rother Disability Forum
 - One You East Sussex
 - Hastings' Business Improvement District
 - Boyley Skate Park
 - Y Centre (YMCA)
 - Locate Sussex
 - Eastbourne Theatres
 - Theatres Trust
 - De La Warr Pavilion, Bexhill
 - Hastings Contemporary and Chair of Hastings and Rother Cultural Leaders Group
 - Museum and Cultural Development Manager and Arts and Cultural Development Officer – Hastings Borough Council
 - Stephen Browning Associates
 - Didcot Cornerstone Arts Centre
 - Tunbridge Wells Assembly Hall Theatre
 - Creative Folkestone

National Governing Bodies of Sport

- Swim England
 - England Hockey
 - England and Wales Cricket Board / Sussex County Cricket
 - Football Association / Sussex County Football Association
 - Lawn Tennis Association
 - England Squash

- Badminton England
 - England Netball
 - Volleyball England
 - Table Tennis England
 - British Judo
 - British Cycling
 - Bowls Development Alliance
 - Petanque England
 - England Boxing
 - England Athletics
 - Parkour UK
 - British Gymnastics
 - British Fencing
 - Floorball UK

Key Findings

We have highlighted the key findings identified during our tier two consultation below:

- Active Sussex were very supportive of this project due to the need for new and improved facilities within Hastings.
 - East Sussex College were supportive of the development.
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
 - Consultation found that it was important for the site to be accessible for all in the community, including people with a limiting disability.
 - It was noted that the programmes being run at the leisure centre and the new cultural venue need to consider the demographic of

Hastings. Consultees noted that cost is a considerable issue due to the high levels of deprivation in the town.

- Consultation found that there is a significant demand for BMX and the Skateboard industry with international organisations being located within Hastings.
[REDACTED]
[REDACTED] - expanding the offer was seen as needed locally.
 - The Sussex FA highlighted the need for further 3G provision, which has been noted within the Playing Pitch Strategy and Football Facility Plan.
 - LTA has highlighted that Hastings is a priority area for indoor tennis and the enhancement of park tennis offer. Table Tennis England noted that they would be interested in taking the PING programme to Hastings, which would encourage casual table tennis participation.

5.3 Tier Three Consultation

This stage of consultation was completed via an online club survey for sport teams and clubs and through public workshops, completed for both leisure and culture. The club survey was sent out via Active Hastings to engage with clubs that use facilities within the borough. For both public workshops, we invited key stakeholders from each sector to attend. Both the online survey and public workshops gave the opportunity to hear the views of the public stakeholders who are involved within the sector in Hastings and the surrounding areas. This tier of consultation enabled us to get detailed insight into each sector within Hastings and help us comprehend local issues and aspirations.

5.3.1 Sports Club Survey

Online surveys were sent to 72 local sports clubs and organisations as part of the consultation process with individual contact information for the clubs sourced via the Council, Freedom Leisure and the Active Hastings team. The surveys gave the clubs the opportunity to give their views on current provision for sport and leisure within Hastings and the Bohemia area and asked them about future needs and aspirations. 32 responses were received, giving a response rate of 44.4%.

5.3.2 Workshops – Bohemia Delivery Group and Sport and Culture

Bohemia Delivery Group

In July 2019, the Consultant Team led a workshop with the Bohemia Project Team to raise discussions on the facilities, the site and the challenges the development will face. This allowed the Consultant Team and the Bohemia Project Team to extract discussions and gain in-depth information.

Cultural and Leisure Workshops

The Consultant Team also facilitated two separate sector-based workshops for culture and leisure. A cultural workshop was held in August and a sport workshop in September. Individuals and organisations within each sector were invited to gain insight into the local thoughts on the leisure and cultural facilities.

Key Findings

We have highlighted the key findings from this consultation below:

- Within the survey we asked which facilities they would like to see provided on our study site in the future. The most popular facility that clubs wish to see provided is a sports hall and swimming pool (60%). Other leading facilities that clubs stated a preference for include multi-use games areas (50%), adventure sports provision (40%), health and fitness suites (35%), Artificial Grass Pitch (35%) and running trails (39%).

- 78% of clubs stated that they are supportive of plans to redevelop and enhance the facilities in the White Rock and Bohemia area. 18% indicated that they are neither supportive nor not supportive, and 4% said they were not supportive of the project. This high level of support indicates that clubs and local organisations are aware of the benefits of redeveloping and improving the facilities currently on offer at the site.
- Within the Bohemia Delivery Group, it was stated the facility should be reviewed in terms of economic and social benefits due to the significant social issues that are within Hastings.
- The Bohemia Group discussed the meaning of co-location. This could be interpreted in different ways – including sharing of resources (e.g. car parking / energy supply), creation of a shared atrium, sharing an external plaza space etc. Equally, there may be no physical connections or immediate adjacencies between the buildings, but just visual links across the site.
- There is a lack of engagement with hard to reach groups and inactive people because facilities are not fit for purpose and are not appealing.
- It was noted that general cost needs to be considered, as well as site accessibility given the lower level of local car ownership. Additionally, Smart pricing was also mentioned here regarding higher prices for tourists during summer months.
- It was suggested that making the most of the views, both up towards the site from the seafront and towards the sea from the facilities could be a very valuable USP, setting the area apart from competitors.
- In the main, the local cultural sector wants a subsidised ‘arts centre’ type offer, although they recognise the importance of a ‘popular entertainment programme’ in Hastings.

- The White Rock Theatre is no longer fit for current purpose and has little or no potential for refurbishment as the cultural centre envisaged in the Options Appraisal Study.

The overall consultation process was extremely beneficial, helping to identify and measure the existing need and demand for the development of sporting and cultural facilities within Bohemia. The process also ensured that all leading partners contributed towards this options appraisal study.

6. Development Options Overview

6.1 Options Overview

The focus of this strategic report is on the delivery and financial appraisal across a range of development options. Example site plans and concepts are highlighted within this section.

The development of leisure and cultural facilities for Bohemia are considered across a number of leading options below. It should be noted that whilst the study considers a like for like replacement of Summerfields Leisure Centre it does not consider a like for like replacement of the White Rock Theatre due to the inherent design shortcomings of the current venue.

Option A: Do Minimum Refurbishment

This option sets out the costs of retaining the existing venues in their current configuration with the necessary works to upgrade the facilities to modern standards and to extend their lifespan for a further 25 years. It should be noted that the costs associated with this option have been provided from estimates from the Hastings Estates Team and HQ Theatres. The study has not included, both from the original brief and also in consultation with the Council Estates Team during this study, any detailed condition survey or analysis of the current facilities.

By common consent The White Rock Theatre is no longer fit for current purpose and has little or no potential for refurbishment as the cultural centre envisaged in the Options Appraisal Study. An Options Appraisal in November 2017, led by Cartas Jonas, identified that a ‘do minimum’ facility would require: a replacement roof; remedial works to the building fabric; full replacement of M&E services including heating and air circulation; installation of sound separation to the Main Auditorium/Sussex Hall; new seating and a replacement floor in main auditorium. Neither the Council nor the current operator have

undertaken a detailed and costed condition survey; however, based on our experience, we estimate the minimum cost of these works could be £10m plus professional fees. The Theatre would be required to close for a minimum of 12 months and after the works were completed the venue would still suffer from inadequate seating capacity for commercial operation, limited technical facilities for staging larger scale shows and poor customer facilities. We estimate the management fee/subsidy required to operate this ‘do minimum’ facility to be in the region of £350k per annum.

To address the wider inadequacies of the White Rock Theatre would likely take the cost of a full refurbishment to between £25-30m and would probably result in a smaller capacity venue with an increased subsidy requirement.

Option B: Like for like replacement of Leisure Centre and a New Entertainment Centre and Enhanced Outdoor Provision

In this scenario, the existing facilities are demolished and replaced with comparable new venues that would include the following:

- New build 4,916m² leisure centre with 25m 6 lane pool, teaching pool, 120 station gym, 2 group exercise studios, 6 court sports hall, squash courts, soft play and café
- New entertainment centre with 1,200 seat/1,800 standing main hall, and a destination café/restaurant shared with the leisure centre
- Public open space and events area
- New outdoor sports hub with all-weather 3G pitch, extended BMX and skatepark, tennis courts and bowling greens
- 300 space car parking

This option sees the White Rock Theatre replaced by a purpose-built Entertainment Centre, owned by the Council and run by a commercial operator on a 25-year lease. The programme would mainly be

commercial music, comedy and pantomime but of a higher quality than the current White Rock Theatre programme. Exemplar venues include G-Live in Guildford, with a capacity of 1,200 seated and 1,800 standing, modern technical facilities, first class customer service and hospitality facilities and a day-time destination café as part of the public space with the new Leisure Centre.

Option C: Replacement Enhanced Leisure Centre, New Entertainment Centre and Enhanced Outdoor Provision

As per Option B, but with an enhanced leisure centre of 8,894m² - increasing water space with a larger 8 lane pool, learner pool, leisure waters with an integrated splashdeck and water fun features which include flumes and/or a wave pool provision. Extended health and fitness facilities would include a 150-station gym, 3 studios and the outdoor provisions enhancements as per Option B.

Option D: Replacement Enhanced Leisure Centre, New Entertainment Centre and Enhanced Outdoor Provision and Arts Centre

Option D provides the same leisure and entertainment centre facilities as Option C but includes an additional arts centre venue. This option builds on the Entertainment Centre with the provision of Arts Centre facilities and programming. It includes a second flexible theatre space for 250 seated/500 standing and two dance/rehearsal studios for community, education and private event use. The Arts Centre would be run by the same commercial operator as the Entertainment Centre, but the programme would have a higher cultural component, including community and educational uses. Exemplar venues include the Cornerstone Arts Centre in Didcot and the programme might include contemporary dance, small scale drama and children's shows. It could also be a venue for Hastings' home-grown music scene, amateur productions of scale, exhibitions, live cinema and hosting an education/community development programme.

These types of Arts Centres, with a small capacity and high cultural value, typically require a subsidy of between £350-500k per annum, but by combining with the Entertainment Centre and being run by a commercial operator the Consultant Team estimate the subsidy could be reduced to £250k per annum.

Option E: Extensively Enhanced Replacement Leisure Centre, New Entertainment Centre and Enhanced Outdoor Provision and Arts Centre

This option includes the same facilities as Option D, but with the expansion of the leisure water offer for the leisure centre and the provision of an indoor waterpark including features such as a lazy river, wave pool and extended flume rides. The leisure centre footprint expands to over 12,000 square metres.

6.2 Capital Costs Summary

Figure 6.1 below sets out the summary of the capital cost estimates associated with each option.

It should be noted that given the level of information available at this early stage of the project, the range of costs provided must be viewed as indicative only. They will need to be subject to further scrutiny at later detailed design stages (following this study). Should the development of the overall project be considered further by the Council, the Cost Consultants recommend that the scope and extent of the works is confirmed by any appointed Design Team, including input from Structural and Services Design Engineers, and that a detailed Cost Plan is produced. No input from services or structural engineers has been used to inform the costs set out in this report. Allowances are therefore based on typical costs per metre squared rates for works of similar type and nature. This cost per metre squared is set at a range typical for leisure builds and entertainment and cultural facilities at the time of this report being produced. In view of the level of information detailed at this feasibility stage, attention is drawn in particular to the assumptions and exclusions

which are appended to this strategic report. These define the allowances and scope of works contained within the respective Orders of Cost. Fee estimates have also been included which include slight variances based on the size of the capital cost estimates.

Figure 6.1 Capital Cost Summary

Option	Capital Costs Leisure	Capital Costs Culture	Indicative Total
A. Do Minimum	£12million	£10million	£25.3million (inclusive of 15% fee estimate)
B. Direct Replacement of current Leisure and Primary Entertainment Centre	£17.1million (+ Outdoor £2.5m) £19.6million	£29.2million	£56.9million (inclusive of external works estimate £1.95m and 12% fee estimate)
C. Enhanced Leisure and leisure waters Primary Entertainment Centre	£33.3million	£29.2million	£71.6million (inclusive of external works estimate £1.95m and 11% fee estimate)
D. Enhanced Leisure, Primary Entertainment and Arts Centre	£33.3million	£35.3million	£77.9million (inclusive of external works estimate £1.95m and 10% fee estimate)
E. Replacement Plus – Waterpark Entertainment and Arts Venue together	£43million	£35.3million	£88.2million (inclusive of external works estimate £1.95m and 10% fee estimate)

*NB: Fee estimate levels vary based on projected capital costs

6.3 Site Plans and Layouts

Figures 6.2 and 6.3 that follow set out some initial site layouts associated with the spatial options being considered as example site layouts. This strategic report highlights the latest work in progress considering the spatial planning and challenges of this large and complex site. As with the options described above, the focus has been on the indoor leisure facilities and the entertainments and arts venue being developed adjacent to one another working as a complex and shared public space. This has emerged as part of both the consultation with operators and from a design and place-making perspective.

All the outdoor facilities are to be enhanced and redeveloped with greater purpose and coherence and the aim to reduce the impact of car parking and working towards some solutions for the coach parking on Falaise Road.

Figure 6.2 Site Plan 1



Site Plan 1

The indicative site plan shows the proposed location of the new leisure centre, entertainment centre and arts centre adjacent to one another on the lower end of the site in close proximity to the seafront and the Pier with the formation of a public square. This option creates a strong visual and physical connection with the waterfront and the Pier on the raised platform of the current bowls green. This option also provides equal presence of both facilities taking advantage of the views and connection with the town.

The creation of a new public square is also not interrupted by Falaise Road and with all the outdoor sports and parking to the west there is the retention of openness at this lower end of the site.

This option splits the indoor facilities and outdoor facilities across Falaise Road which would require the consideration of an outdoor sports hub to service the relevant sports. This option, with the outdoor bowls green relocated to the north of the west side of Falaise Road, creates potential to retain a smaller and more efficient indoor bowls centre, bringing the indoor and outdoor bowls together in a more coordinated manner.

Figure 6.3 Site Plan 2



Site Plan 2

This site plan option retains the approach of shared public space and the opportunity for the new public square. The public square is, however, in closer proximity to Falaise Road and would require a solution for coach parking to have been identified.

This option relocates all indoor and outdoor facilities on the one site. However, this results in less connected outdoor sports, especially the BMX/skatepark as currently set out.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] There is also the loss of the linkages of the new facilities to the seafront, Pier and the town for these proposed flagship projects.

7. Outline Business Case and Evaluation Section

7.1 Introduction

The leisure and cultural facilities in Hastings (Summerfields Leisure Centre, Falaise Fitness Centre and the White Rock Theatre) are approaching the end of their useful economic life and are in urgent need of major capital investment to secure their long-term futures and contribute to the economic and cultural regeneration of Hastings.

This study has found that a do minimum approach is unlikely to be a long-term or viable option and a major redevelopment is required to deliver commercially viable facilities that meet the current and future leisure and cultural needs of Hastings residents and visitors.

The Outline Business Case (OBC) has been prepared in accordance with the HM Treasury “Guide to Developing the Project Business Case” and applying the Five Case Model Methodology.

The OBC makes the case for change, identifying a preferred option which optimises public value following a detailed options appraisal, setting out a potential procurement solution and confirming the affordability and VFM of the preferred option and the arrangements for the successful delivery of the project.

The OBC sets out the:

- **Strategic Case** for redeveloping the facilities that aligns with Council, regional and national strategies and priorities, supported by a robust needs' analysis and a clear definition of the outcomes and benefits sought.

- **Economic Case** for change based on a detailed options appraisal against a set of clear critical success factors that has identified a preferred redevelopment and future operating option.
- **Commercial Case** for the redevelopment of the facilities that would enable an operator to be procured who would deliver the financial, leisure, cultural and social value outcomes sought by the Council.
- **Financial Case** demonstrating that the preferred redevelopment and operating options are affordable and would deliver the best VFM outcome for the Council over the long term.
- **Management Case** demonstrating that the redevelopment project and future operating arrangements can be successfully delivered by the Council and the outcomes and benefits sought achieved.

The preferred option (Option C) involves the replacement of the existing facilities with a new, enhanced leisure centre, enhanced outdoor provision and entertainment centre (but not at this stage the arts centre) as part of a wider mixed-use redevelopment of the Bohemia site that involves:

- Demolition of the existing Summerfields Leisure Centre, Falaise Fitness Centre and the White Rock Theatre.
- The construction of a new wet and dry leisure centre.
- The construction of a new entertainments centre (and potential arts centre).
- The creation of an outdoor sports hub.
- The creation of a new public square and event space with improved access to the town centre, public transport and the Hastings Pier and seafront.
- [REDACTED]
- [REDACTED]
- [REDACTED]

- Procurement of an experienced external operator (or operators) to manage the new leisure and cultural facilities under a long-term outcome-based contract.

The new facilities would be expected to generate a revenue surplus for the Council which would help offset some of the costs of financing the required capital investment. The total net costs of the preferred redevelopment option at £37.3m over 25 years would be less than those of the do minimum refurbishment option, confirming the affordability and VFM of the redevelopment project.

The business case set out in this section is a critical part of the overall feasibility study and will help place the Council in a position to seek approval for progression to the next stage of the project and the development of the design brief.

7.2 Strategic Case

7.2.1 The redevelopment proposal

The project involves the replacement of the existing facilities as part of wider mixed-use redevelopment of the Bohemia site to create a financially viable leisure and cultural destination that meets the sport, leisure and cultural needs of Hastings residents and visitors and enhances the overall Hastings tourism offer.

7.2.2 The case for change

The Bohemia leisure and culture development will contribute towards a number of local, regional and national strategies and plans which are included in Section 4.

The government's 'Sporting Futures', a strategy for an active nation, and the subsequent Sport England strategy 'Towards an Active Nation' look beyond simple participation to how sport changes lives and becomes a

force for good. The strategy seeks to increase the number of people who engage in sport and activity, not for its own sake but for the wider benefits it can bring, in terms of physical and mental wellbeing and individual, community and economic development.

Sport England's contribution to support delivery against the five government outcomes focuses on two areas, each with a number of specific aims, which are:

- More people from every background regularly and meaningfully engaging in sport and physical activity
- Inactive people becoming active
- More resilient habits
- More positive attitudes among young people
- More diverse volunteers
- Improved progression and inclusion in talent development
- A more productive, sustainable and responsible sport sector
- A more demand-led sport sector that welcomes everyone
- Improved governance
- Improved financial efficiency
- Increased and more diverse revenue generation
- Increased diversity of leadership
- A diverse and productive workforce

The Bohemia leisure and culture development will contribute to the aims within these two areas as follows:

More people from every background regularly and meaningfully engaging in sport and physical activity.

The project will:

- Increase the number of people regularly taking part across a wide range of sports, with a focus on reaching out to the less active within the local community and working closely with resident clubs.

- Increase the number of leisure and community events being held at the venue and increase the opportunities for residents to participate in and attend such events, especially young people.
- Continue to provide a base for sports clubs to identify and nurture talent.

A more productive, sustainable and responsible sport sector.

The project will:

- Provide better quality facilities to satisfy existing demand as well as creating new activity areas to attract new users.
- Improve governance through the procurement of a new operating partnership.
- Create a leisure venue to provide high quality training and development facilities to support sports clubs.
- Deliver a financially robust centre with enhanced and diversified revenue generation and more efficient operations.

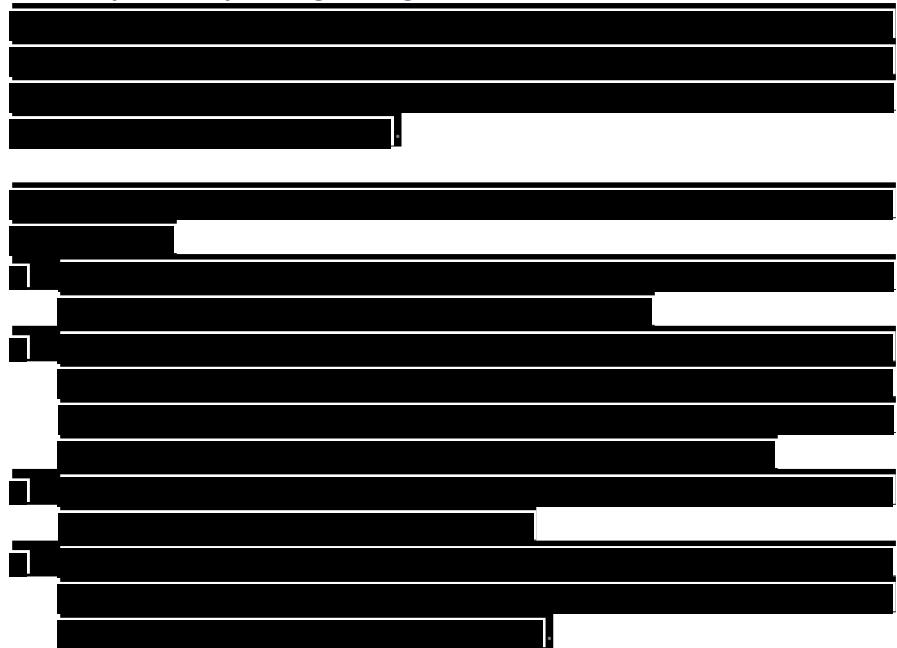
7.2.3 User Needs Analysis

Extensive consultation has been undertaken with the sports users, clubs, NGBs and other cultural organisations who currently use or would like to utilise the leisure and cultural facilities. The wide range of consultees is set out in Section 4 of this strategic report, the needs analysis findings can be summarised as:

- The facilities provided at Summerfields, Falaise and White Rock are no longer fit for purpose.
- Access around the Bohemia site and between the town centre, transport hubs and seafront is confusing and unclear.
- Footfall and participation in leisure and cultural activities would be increased with modern, flexible facilities that offered a more varied programme of activities.

- More needs to be provided to attract new users into the venues, especially the less active within Hastings and tourists from outside the town.

7.2.4 Improved Operating Arrangements

A large rectangular area of the page is completely blacked out with a solid black rectangle, indicating that the content has been redacted for confidentiality.

7.2.5 Benefits

A redeveloped Bohemia leisure and cultural offer would bring a number of benefits for the Council, local residents and visitors, including:

- Creating a new integrated leisure and cultural venues for Hastings with high quality facilities that increase opportunities for local residents and visitors to participate in leisure and cultural activities.
- Securing a long-term future for sport and the arts within Hastings and raising the profile of Hastings as an attractive place to live, work and visit.

- Financially viable facilities that generate an operating surplus and do not require a subsidy from the Council.
- More energy efficient and environmentally friendly facilities with a reduced carbon footprint, which aligns with the Council's climate emergency position of being carbon neutral by 2030.

7.3 Economic Case

7.3.1 Introduction

This section of the business case sets out the need for the Bohemia leisure and culture facilities project based on a detailed options appraisal against a set of clear critical success factors that has identified the preferred development option.

7.3.2 Critical Success Factors

A list of Critical Success Factors (CSFs) the project must achieve have been identified, against which potential options have been assessed. These CSFs for the project are:

- Increase participation in leisure and culture - promoting healthier and more engaged lives
- Provide a long-term solution for sport, culture and community facilities in Hastings and East Sussex
- Act as a catalyst for the regeneration of Bohemia and overall development of Hastings including the visitor economy
- Provide a positive contribution to Climate Change agenda
- Offer affordability
- Offer long-term financial sustainability
- Integrate and enhance open space
- Have achievable Timescale and Deliverability

7.3.3 Long List Options

A number of long list options for the redevelopment of the leisure and cultural facilities have been appraised against the CSFs. The options considered were:

Do nothing

This option would involve the Council continuing to support the existing leisure and cultural venues with no investment in the assets. There would be an increase in the net operating costs of the facilities and there would be concerns about the long-term future of the buildings without investment, given the age of the buildings and their current condition. Therefore, **doing nothing is no longer a viable option and has consequently been discounted**.

Disposal of the facilities

This option would involve the Council transferring the sites to a 3rd party operator(s) under a long lease. The costs associated with bringing the facilities up to a modern standard of provision would limit any commercial interest, without major upfront investment from the Council and retention of some of its landlord obligations. Given the likely investment costs to the Council together with the lack of certainty that any future operator(s) would protect and promote affordable access, as well as ongoing landlord obligations, this **option is unlikely to be deliverable and has consequently been discounted**.

Do minimum

This option would involve undertaking the minimum amount of works required to bring the facilities up to modern standards and secure the long-term future of the venues. **This option has been shortlisted as the base line model against which other shortlisted options can be compared.**

Demolish facilities and develop like for like replacement leisure centre and new entertainment centre.

This option would involve the existing facilities being demolished and replacement leisure and entertainment centres being developed on a comparable scale, securing a long-term future for the venues and helping catalyse the regeneration of Bohemia. It should be noted that whilst the study considers a like for like replacement of Summerfields Leisure Centre, it does not consider a like for like replacement of the White Rock Theatre due to the inherent design and shortcomings of the current venue. Whilst this option would not be the cheapest option in terms of upfront investment, it is expected to deliver the best overall financial outcome and **this option has therefore been shortlisted.**

Demolish facilities and develop enhanced replacement

This option would involve the existing facilities being demolished and replaced with enhanced leisure and cultural facilities, securing a long-term future for the venues, increasing footfall and participation, and helping catalyse the regeneration of Bohemia. Whilst this option would be the most expensive in terms of upfront investment, it is expected to deliver a financial outcome comparable with other options and it would deliver the highest impact in terms of visitor spend and other social value outcomes. **Therefore, this option has also been shortlisted.**

7.3.4 Short Listed Redevelopment Options

Five development options have been shortlisted for further detailed analysis. These are:

Option A: Do Minimum Refurbishment

This option sets out the costs of retaining the existing venues in their current configuration with the necessary works to upgrade the facilities to modern standards and to extend their lifespan for a further 25 years.

Option B: Like for like replacement of Leisure Centre and a New Entertainment Centre and Enhanced Outdoor Provision

In this scenario, the existing facilities are demolished and replaced with comparable new venues that would include:

- New 4,916m² leisure centre with 25m 6 lane pool, teaching pool, 120 station gym, 2 studios, 6 court sports hall, squash courts and soft play
- New entertainment centre with 1,200 seat/1,800 standing main hall and a destination café/restaurant shared with the leisure centre
- Public open space and events area
- New outdoor sports hub with all-weather 3G pitch, BMX and skatepark, tennis courts and bowling greens
- 300 space car parking
- [REDACTED]

Option C: Replacement Enhanced Leisure Centre, New Entertainment Centre and Enhanced Outdoor Provision

As per Option B, but with enhanced 8,894m² leisure facilities including larger 8 lane pool, 150 station gym, 3 studios and leisure waters.

Option D: Replacement Enhanced Leisure Centre, New Entertainment Centre and Enhanced Outdoor Provision and Arts Centre

As per Option C but with an additional arts centre consisting of a 250 seat/500 standing second venue and two dance/rehearsal studios.

Option E: Extensively Enhanced Replacement Leisure Centre, New Entertainment Centre and Enhanced Outdoor Provision and Arts Centre

As per Option C but with a larger leisure pool.

The financial impact of each of the proposed development options has been considered, setting out the case for capital investment based on the long-term revenue impact of each option.

This will help inform and guide the Council on where best to direct the significant public investment required to deliver a more sustainable future for leisure and culture and maximise the leisure, arts, health and wider social outcomes.

7.4 Evaluation Framework

7.4.1 Introduction to Evaluation Framework

Having reviewed the general advantages and disadvantages of each of the options presented, alongside the overall capital costs the options are now reviewed against an evaluation framework which looks to establish which of the options is the most viable and sustainable solution for the Council and the local community. Each option has been evaluated according to a set of weighted financial and non-financial criteria. These are set out below and cover a number of the strategic priorities, consultation headlines and the aims and aspirations of the Council (as set out in the brief). These criteria have been reviewed and agreed by the Bohemia Project Team and Senior Officers with the Consultant Team.

7.4.2 Criteria for Evaluation

Each option has been evaluated and scored against a set of weighted financial and non-financial criteria to help with a consistent approach to appraising them. The criteria that have been utilised are as follows:

- The extent to which the development will lead to an increase in participation in leisure, physical activity and culture and promote more active, healthy and engaged lifestyles.
- The extent to which the investment will provide a long-term solution for enhanced leisure and cultural facilities in Hastings and East Sussex.
- Act as a catalyst for the priority regeneration of Bohemia and overall development of Hastings, including the visitor economy.
- Provide a positive contribution to the Climate Change agenda.
- The affordability of the development option and capital costs.

- The long-term financial sustainability of the option and the revenue impact.
- The extent to which the option integrates and enhances the open space across Bohemia.
- The potential development timescales and deliverability associated with the respective option.

7.4.3 Assumptions

The construction period is assumed to be 6-12 months for refurbishments and 18-24 months for new build, with construction expenditures spread evenly over these periods. Works would be phased to ensure that the current facilities remain open whilst any new build is being developed within the new build scenarios.

Alongside the detailed operational revenue planning that has been undertaken for each option, the capital delivery programme for funding the project has also been set in alignment with the Council's own internal financial model. Each option has been modelled with funding provided through borrowing. The new build options have been factored over a 40-year period with the refurbishment option over 25 years. Each option has an interest rate of 3% (based on Public Loans Work Board published interest rates at the time of this report).

7.4.4 Evaluation Scores

In order to compare the options in a consistent manner, we have scored the non-financial criteria out of 5, using the scale that is indicated in Figure 7.1 below.

Figure 7.1: Scoring Criteria

Criteria	Score
Requirements met, no reservations at all	5
Requirements met, but with some reservations	4
Requirements met adequately, but with reservations	3
Requirements only partially met	2
Significant reservations and unlikely to be acceptable	1
Fails to meet requirements	0

Figure 7.2 sets out the non-financial analysis of the options against the evaluation criteria.

Figure 7.2: Evaluation of the Options

Evaluation Criteria	Weighting %	A	Score	B	Score	C	Score	D	Score	E	Score
Increase participation in sport and culture - promoting healthier and more engaged lives	20	1	20	3	60	4	80	5	100	5	100
Provide a long-term solution for sport, culture and community facilities in HBC and E Sussex	10	1	10	3	30	5	50	5	50	5	50
Act as a catalyst for the priority regeneration of Bohemia and overall development of Hastings including the visitor economy	10	1	10	3	30	5	50	5	50	5	50
Provide a positive contribution to Climate Change agenda	10	2	20	4	40	4	40	4	40	3	30
Affordability	20	3	60	5	100	4	80	3	60	1	20
Long term financial sustainability	15	1	15	3	45	4	60	3	45	3	45
Integrate and Enhance open space	10	1	10	4	40	3	30	2	20	2	20
Timescale and Deliverability	5	1	5	3	15	3	15	3	15	2	10
TOTAL SCORE	100	A	150	B	360	C	405	D	380	E	325

7.4.5 Evaluation Review

Commentary and evaluation of the score received by each option is provided below.

Option A – Refurbishment of Summerfields Leisure Centre and White Rock Theatre – Score of 150

In effect, this option fails to address a number of key strategic objectives and priorities, not least the aim of providing new facilities at the site that support an aspiration to increase levels of participation in leisure and cultural activity within Hastings.

This option has the lowest capital cost requirement but does not provide a long-term solution for either of the two lead facilities or the Bohemia area. It does not enhance the facility mix and range of activities that can be offered and does not include any investment into facilities within the open space.

However, whilst for the leisure centre the pool hall is refurbished, this option does not include the opportunity to increase the size and flexibility of the water space, which is a significant barrier to increasing participation in aquatics activity at the site. Likewise, for the White Rock Theatre this does not address any of the shortcomings of the current theatre space.

Whilst in pure capital outlay terms this option comes with a lower cost, the Consultant Team feel that this option would to an extent only “paper over the cracks” in many areas of both ageing facilities. It is our view that it does not provide a solution that resolves all identified shortfalls within the leisure centre and theatre.

It is also important to note that the works involved within the refurbishment and remodelling of the centre would clearly disrupt service provision at the site. The work can be phased to ensure that the leisure

centre does not have to close for an extended period but there will be times when key areas of the facility, such as the pool hall, would be out of commission whilst works were undertaken. The theatre would need to close for a significant period.

This option does very little for the overall regeneration or enhancement of the community offer across Bohemia and is unlikely to secure funding from external sources or indeed to be viewed as favourable for the internal use of resources.

Option B Direct Replacement Leisure Centre + New Entertainment Centre + Outdoor Facilities – Score 360

The provision of a new build leisure centre and entertainment centre is very positive for Hastings given the age and condition of the current facilities. The enhanced outdoor sports facilities and the potential development of a new public square is also a notable improvement on the current poor status of the outdoor space for leisure and culture and a key factor in the overall regeneration of Bohemia.

This facility option for leisure however does not provide much in the way of additional provision and its impact on increasing participation and revenue generation is not as highly scored as the other options. The focus on a lower budget and direct replacement does not address the wider demands and needs for Hastings. Whilst the water space is to be more flexible and provide a better programme, the capacity of a like for like replacement is not extended as it is with other options particularly for leisure water provision.

The redevelopment of the White Rock Theatre to a new entertainment centre is extremely positive, addressing the key market demand for culture within Hastings and working alongside other regional facilities.

The scale of the centre enables it to operate without subsidy. This option, however, does not address the wider arts centre needs that have been identified within the analysis, consultation and the brief.

Option C - Enhanced Leisure Centre + New Entertainment Centre + Enhanced Outdoor Facilities – Score 405

This option scored the highest total across all the options. It provides a leisure centre that offers larger facilities, including an increased level of water space, leisure water, a better designed sports hall space, a bigger health and fitness suite and larger studios. All of these extended facilities alongside the enhanced outdoor spaces, will improve the capacity at the site. This will help increase the opportunities for participation and significantly increasing income generation.

This option secured high scores for increasing participation in sport and culture as well as addressing the facility needs for Hastings in terms of greater water space and enhanced outdoor facilities.

As with Option B it provides a new build facility that can be developed in a more effective and efficient manner to meet modern building requirements, investigate effective ways to work towards being carbon neutral for Hastings and meet wider market demands and needs.

As detailed earlier within the business case the additional capacity of the leisure offer enables a better financial performance for the leisure and provides a longer-term net position very similar to Options A and B with a higher level of specification and range of services.

As with Option B the entertainment centre meets the leading market demand for culture within Hastings.

This is considered the preferred delivery option for the Council based on the financial analysis and this combined financial and non-financial analysis by the Consultant Team.

Option D - Enhanced Leisure Centre + New Entertainment Centre + Arts Centre + Enhanced Outdoor Facilities – Score 380

This option scored second highest as it provides the additional arts centre to complement the entertainment centre with the same facility mix as Option C.

Option D however has additional financial risks associated with the arts centre. Not only the additional capital costs and borrowing but also the

[REDACTED]

This option does meet all of the needs of the consultation both for leisure and culture and is a very close match to meeting all aspects of the brief. However, given the financial profile, Option D is considered only achievable for Hastings if they can lever in additional capital funding. The financial analysis and business case are currently based upon the assumed capital receipts for the current Summerfields Leisure Centre,

[REDACTED]. Option D with its wider specification for arts is considered only achievable if additional capital could be secured to reduce the capital financing gap and the overall net delivery cost to the Council.

Option E - Leisure Waterpark + New Entertainment Centre + Arts Centre + Enhanced Outdoor Facilities – Score 325

This option addresses the original wider needs of the Council's brief and is the closest match to the original facility aims of the study providing a

destination leisure waterpark venue and entertainment venue and arts centre.

The cost and deliverability issues identified for Option E have had an impact on the scoring of this option as the increased leisure waters at this scale provide only small net impact on the revenue in comparison to the impact on capital and running costs. The Consultant Team are concerned over the affordability of Option E for the leisure set alongside the subsidy required for the arts centre as part of the overall mix. The larger scale leisure facility would also put significant pressure on car parking and potentially compromise the wider outdoor sports provision needs.

7.4.6 Option Scoring Summary

Given the results of the evaluation, the refurbishment option scores very poorly and appears to be the least viable option as it does not address the key strategic priorities and objectives of the brief and the aspirations of the Council. The longer term financial costs of Option A compare very poorly to the new build options given the ongoing subsidy associated with both the leisure and culture facilities, which will deliver little improvement on the current programme and activity.

Given that new build and redevelopment of the two facilities is the most effective use of the Council's investment the evaluation of what level of investment and service has directed us towards the option which delivers the best outcomes for the Council. Option B does provide a very positive solution at a lower cost than those that are associated with the other new build project but is limited in its ability to increase the capacity of the offer for leisure. This is particularly relevant when considering the swimming pool space requirements in Hastings and the evident demand.

The financial analysis has shown that Option C provides a notable increase on leisure capacity, water space alongside the provision of a new

entertainment centre and scores the highest. Therefore, this is emerging as the preferred option for the Consultant Team.

Options D and E are considered as higher risk for the Council to deliver with the current potential development funding package that has been identified so far by the Bohemia Project Team. Option D is potentially deliverable, meeting the majority needs of the original brief but only if additional resources can be identified from other locations or developments in Hastings. The Consultant Team view Option E as too high risk and unaffordable for the Council to pursue. The view of the Consultant Team is that the potential delivery of Option B is a minimum, Option C is the preferred priority and Option D is subject to additional development funding opportunities or external grant aid to be identified by the Council.

Option C, the enhanced leisure and cultural offer scores best overall of the shortlisted option against the weighted evaluation criteria and **has been identified as the preferred development option.**

7.5 Future Management Options

The existing management and operational arrangements for both the leisure facilities and the White Rock Theatre are based on the Council seeking to achieve the best financial outcome, whilst ensuring the venues continue to offer an affordable and accessible programme of leisure and cultural activities. The leisure facilities at Summerfields and Falaise are managed under a long-term management contract by Freedom Leisure, a Sussex based leisure charity that manages a number of public leisure centres across the Sussex and elsewhere in the UK. The White Rock Theatre is managed by HQ Theatres, a leading commercial operator of theatres and cultural venues in the UK. The leisure centre is not subsidised by the Council, although it does have to invest in the facilities as part of its landlord obligations. The theatre contract is currently on a

£350,000 per annum subsidy which has been reduced from £650,000 in previous years.

Going forward any future management arrangements need to build on and embed the strategic priorities of the Council, focused on increasing community participation in leisure and cultural activities and delivering improvements in residents' health and wellbeing, whilst ensuring the facilities are operated as efficiently as possible.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Page 68

7.5.1 Long List of Service Delivery Options

There are several service delivery approaches that are usually considered as part of management options appraisals for community leisure and cultural facilities. These are highlighted within this section. However, given the current arrangements it is the view of the Consultant Team that some options can be eliminated from the process at an early stage.

Consideration has been given to the operating model and the configuration of facilities and the potential variations of delivery solutions. It is assumed that the Council would retain ownership of the built assets and that TUPE would apply in all instances.

The broad delivery options that have been considered and the likely suitability of each is summarised as follows:

7.5.2 Direct In House Provision

The Council no longer manage or operate any major leisure or cultural facilities, and there is no existing leisure or culture management team or experience of operating facilities of this nature. Bringing outsourced leisure services back in house very rarely if ever, occurs as the costs of doing so are often significant. It would result in the loss of the VAT exemptions [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] The Council would need to undertake a detailed appraisal of the likely costs of bringing the services back in house against the potential benefits.

As control and influence can be achieved through effective partnership and intelligent client arrangements, there is no obvious case for considering this option further. This option is not recommended for further consideration.

7.5.3 Establishing a wholly owned and controlled not for profit company

Local authorities have the powers to establish a wholly owned and controlled company to deliver services (often referred to as a WOC or LATC). This in effect is similar to direct in-house provision, although there are currently NNDR (National Non-Domestic Rates) and VAT advantages to this type of model. For the same reasons as highlighted above in option a (direct in-house provision), that is the lack of venue management expertise and capacity and TUPE costs, this option is not recommended for further consideration.

7.5.4 Establishing a new Charitable Trust (NPDO)

A non-profit distributing organisation (NPDO), usually referred to as a charitable trust, is a well-established delivery model for leisure and cultural facilities across the UK. The origins of the current leisure operator

(Freedom Leisure) were developed through this route. The establishment of local trusts, which were generally formed from within local authorities, became a popular delivery model up until 2016 where NNDR, VAT advantages and increased freedoms to operate in a more streamlined and commercial manner were the main drivers.

In 2016, new EU Procurement Guidance required newly established trusts to compete in an open procurement exercise. For the leisure centre, a new trust is unlikely to be able to successfully compete in the open market against established operators. There are numerous costs associated with the establishment of a new trust including: brand development; head office overheads; recruiting trustees; and forming a Board. There are also other factors to consider including: the cost of procurement (a ‘bid team’); development of Business to Business relationships (equipment, supplies, agencies, utilities etc.); and ensuring the new trust has sufficient reserves at the outset to enable them to manage cash flow pressures. Establishing a new Culture Trust would have similar costs and the commercial nature of the Entertainment Centre proposed does not lend itself to a non-profit ethos.

Given the cost of establishing and procuring a new trust, combined with the low probability of a successful procurement outcome for the trust, this option is not recommended for further consideration.

7.5.5 Existing Charitable Trust

There is a well-established and mature market for leisure where charitable trusts already have a substantial market share of public leisure provision. There are several ‘single contract’ trusts in existence across the UK as well as numerous larger operators who have expanded considerably from their original ‘host’ authority and now operate a sizeable portfolio containing multiple contracts (such as Freedom Leisure). These larger trusts often absorb the smaller trusts through a procurement exercise. They actively compete with each other and private

sector/hybrid operators. Whilst leisure trusts are prominent, there are a number that operate across both the cultural and leisure spectrum. However, these are often more locally focussed than the larger leisure trusts. This model currently secures NNDR and VAT advantages brought about via their charitable status.

In the culture sector, most trusts operate a single venue or organisation and there are no suitable trusts in Hastings. [REDACTED]

[REDACTED] Charitable Trusts are a successfully proven delivery model and should be considered further by the Council. This option is recommended for further consideration.

7.5.6 Commercial Operators / Private Sector Businesses

There have been notable changes within the private sector in recent years and all of the main commercial leisure management operators have established their own NPDO model operating vehicles. As NPDO businesses, they benefit from a range of NNDR and VAT advantages but are distinct from Charitable Trusts and social enterprises due to their links back to private sector, profit-making businesses which often have contractual controlling powers.

In the cultural sector there are a small number of commercial operators and one or two who operate both leisure and culture facilities. Access to capital funding via private sector organisations was historically viewed as an advantage, although in recent years access to prudential borrowing in the public sector has effectively nullified this advantage. For the purposes of this stage of options appraisal, private sector businesses operating NPDO models are recommended for further consideration.

7.5.7 Community Asset Transfer (CAT)

Although promoted by government as a tool to provide local communities with more and direct control over local facilities, the

Community Asset Transfer (CAT) model has generally been successful for smaller scale community facilities i.e. local swimming pools and sports pavilions, often when facing closure. A new or existing community group would not have the capacity, capability or financial standing to take on the operation of the large leisure and cultural venues envisaged. Whilst there may be scope to facilitate CAT arrangements for some of the outdoor sports hub facilities, this option is not recommended for further consideration.

7.5.8 Other

There are other theoretical models such as a Public Service Mutual and Privatisation and divesting from provision entirely. However, neither option is considered viable. The Public Service Mutual route requires a body prepared and capable of operating major leisure and cultural facilities, in addition to successfully winning a procurement exercise. It is not considered viable for an entity of this scale.

Privatisation and fully divesting from provision are unlikely to be attractive to a wholly commercial operator where commercial development opportunities may be limited. Additionally, this approach would not be consistent with the Council's outcome requirements of ensuring affordable access to leisure and cultural opportunities. It is likely to be highly contentious and damaging to relations with stakeholders.

In all delivery models considered above, the facilities would remain in the ownership of the Council but would be managed and operated by a third party under a management agreement and long-term lease. In all instances, TUPE would apply if an operator other than the current incumbents were engaged to operate the facilities.

7.5.9 Potential for Integrated Management Arrangements

The preferred option envisages the new leisure and cultural venues sitting alongside each other around a new public open space. Whilst the current facilities are managed separately by specialist leisure and entertainment providers, there may be scope for one operator to manage both venues.

This could bring economies of scale and scope for more efficient operations.

The views of the leisure operators suggest that some are, in principle, open to combined management of the leisure and cultural facilities. That said, experience from recent procurement exercises indicates that it is essential that the cultural facilities are managed by an operator with extensive experience and credentials in this market, which most leisure operators lack. It is likely that the separate management of the leisure and cultural facilities will deliver the best outcome for the Council, with some scope for closer working around the food and drink offer.

7.5.10 Short List of Service Delivery Options

Following the initial assessment of the broad options potentially available, there are three core delivery options that are recommended to be taken forward for further consideration. These are:

- Charitable Trust
- Private sector NPDO hybrid
- Commercial operator

7.5.11 Conclusion

There is unlikely to be any discernible difference between an established charitable trust and the private sector with an established NPDO in terms of the financial offer and the Council having the security of its contractual outcomes delivered. Given the need to maximise market interest in the future management of the redeveloped facilities it is therefore important to ensure that established charitable trusts, private sector hybrid operators and purely commercial operators are encouraged to participate

in any future procurement exercise for both the leisure and cultural venues.

7.6 Commercial Case

7.6.1 Introduction

This section of the business case sets out how the procurement of the preferred option will be delivered in accordance with procurement requirements.

7.6.2 Market Engagement

Some informal market engagement has been undertaken with the existing leisure and culture operators to inform the procurement strategy and to identify likely market interest in operating redeveloped facilities.

7.6.3 Market Interest

The discussions with the incumbent operators identified that there would be far more interest in operating new facilities rather than running refurbished venues with all the constraints this would entail, and that this would deliver a better financial outcome for the Council. The loss of provision whilst refurbishment works took place would be a significant concern for the operators as it would impact on their business plans. New build projects and continuity of provision are seen as being much lower risk for both the Council and the operators.

7.6.4 Procurement Process and Timetable

Leisure and cultural management contracts tend to be procured in the form of a two-stage competitive tender process, following the qualification of potential operators, involving an initial detailed submission followed by evaluation and dialogue and then submission of a refined, final offer. The procurements take around 12 to 15 months to

complete followed by a 3-month mobilisation period before the contract commencing. This could run in parallel with the construction phase of the project so that the new facilities would be operated under the new contract arrangements.

Leisure operators prefer to use a standard suite of contract documents which they are familiar with, consisting of a management contract (or concession contract) with a detailed services specification, lease and schedule of payment and performance arrangements. Sport England have issued a revised version of their standard contract documents for leisure projects and using this documentation is likely to help any funding submission from Sport England.

7.6.5 Allocation of Trading and Property Risks

Operators are generally prepared to take on all trading and property risks associated with operating and maintaining leisure and cultural facilities, except for latent defects and structural risks. This assumes the buildings are in relatively good condition and detailed conditions surveys have been undertaken, or in the case of new buildings warranties can be novated.

7.6.6 Rate Relief

All of the leisure operators utilise some form of not for profit structure to take advantage of the mandatory and discretionary rate relief available to not for profits.

7.6.7 Length of Contract

Current leisure management contracts tend to be at least 15 years in length (usually 10 years with an option to extend by 5), with some extending to 25 years if a capital contribution is required.

7.6.8 Pricing and Programming

Operators will require a degree of commercial freedom around programming and pricing, to ensure that they can optimise income generation and submit a competitive financial proposal to the Council. This is especially true around fitness and swimming lessons as these two activities account for a large proportion of any leisure centres' total income. For the Entertainment Centre a detailed set of KPI's can be agreed with the operator covering programme and other matters.

7.6.9 Procurement Strategy

To enable a new operator to be appointed and allow for a 3-month mobilisation period, a decision would not need to be taken around procuring an operator until the construction phase had commenced, assuming a build phase of at least 18 months.

The following key activities would need to be completed by the Council:

- o Secure formal approvals for the project and the funding package.
- o Sufficiently develop the design and costs of the development proposals, so operators have clarity as to the future layout, schedule and range of facilities they are bidding to manage.
- o Prepare a schedule of works that details how the complex phasing of the various stages of the development project would take place.
- o Prepare a lifecycle maintenance cost plan that provides sufficient detail of the projected costs of maintaining the new facilities over the term of the new contract.
- o Prepare and approve the formal tender and contract documentation, including the management contract, lease, specification, maintenance obligations and performance management regime.
- o Collate the required tender background information, including financial data and user information.
- o Prepare a shadow financial model setting out the projected income and costs of operating the redeveloped facilities to provide the Council with a minimum expected future revenue position against

which tender submissions can be evaluated and future affordability and value for money can be determined.

7.6.10 Proposed Procurement Timetable

An indicative procurement timetable is set out below for a management contract to give an illustration of the various activities that need to be completed.

STAGE	DATE
Issue Contract Notice	Month 1
Pre-Qualification Stage	Month 2
Invitation to Submit Initial Proposals	Month 3
Submission of Initial Proposals	Month 5
Evaluation Stage	Month 6 – 7
Invitation to Submit Detailed Proposals	Month 8
Submission of Detailed Proposals	Month 11
Evaluation Stage	Month 12
Appoint Preferred Partner and Due Diligence	Month 13-14
Contracts signed	Month 15
New Contract commences	Month 18

7.7 Financial Case

7.7.1 Introduction

This section of the report sets out the projected net financial impact to the Council of each of the development options. The financial case demonstrates that the preferred development option is affordable and

will deliver better VFM than the other development options and the baseline do minimum option.

7.7.2 Overview of Options – Net Costs

Each of the development options has been appraised and a 25 year financial projection prepared to provide an illustration of the likely net costs of each scheme.

The focus has been to identify those options that will generate the optimum net financial impact based on the initial upfront capital investment and ongoing revenue costs.

All figures are at current prices with no adjustment for inflation. In some activity areas the figures have been adjusted in the first 2-3 years to allow the impact of the investment proposals to take effect and for usage to increase.

Further work is required to better understand the potential phasing of the funding into the project from the residential development and the impact this will have on the project and Council's cash flow.

7.7.3 The Development Options

Option A: Do minimum Refurbishment

This option sets out the costs of retaining the existing venues in their current configuration with the necessary works to upgrade the facilities to modern standards and to extend their lifespan for a further 25 years.

Option B: Like for like replacement of Leisure Centre and a New Entertainment Centre

In this scenario, the existing facilities are demolished and replaced with comparable new venues that would include the following:

- New 4,916m² leisure centre with 25m 6 lane pool, teaching pool, 120 station gym, 2 studios, 6 court sports hall, squash courts and soft play
 - New entertainment centre with 1,200 capacity main hall and café/restaurant
 - Public open space and events area
 - New outdoor sports hub with all-weather 4G pitches, skatepark, tennis courts and bowling greens
 - 300 space car parking
- [REDACTED]

Option C: Replacement Enhanced Leisure Centre, New Entertainment Centre and Enhanced Outdoor Provision

As per Option B, but with enhanced 8,894m² leisure facilities including larger 8 lane pool, 150 station gym, 3 studios and leisure waters.

Option D: Replacement Enhanced Leisure Centre, New Entertainment Centre and Enhanced Outdoor Provision and Arts Centre

As per Option C but with an additional arts centre consisting of a 250 capacity second hall and two dance/rehearsal studios .

Option E: Replacement leisure and cultural facilities with extensively enhanced leisure and arts provision

As per Option C but with a larger leisure pool.

Figure 7.3 summarises the overall income and expenditure for each development option (Year 3).

Figure 7.3 – Annual Revenue Projections

Option (000's)	Annual Revenue Position	Annual Financing Costs	Net Annual Costs	Net Costs Over 25 years	NPV
A					
Leisure	(£135)	(£517)	(£652)	(£16,298)	(£11,037)
Culture	(£350)	(£489)	(£839)	(£20,963)	(£13,820)
Combined	(£485)	(£1,006)	(£1,490)	(£37,261)	(£24,857)
B					
Leisure	£251	(£567)	(£315)	(£7,883)	(£5,197)
Culture	£0	(£1,081)	(£1,081)	(£27,017)	(£17,811)
External works	£0	(£94)	(£94)	(£2,356)	(£1,553)
Combined	£251	(£1,742)	(£1,490)	(£37,257)	(£24,562)
C					
Leisure	£404	(£1,218)	(£815)	(£20,369)	(13,429)
Culture	£0	(£1,068)	(£1,068)	(£26,700)	(17,602)
External works	£0	(£94)	(£94)	(£2,356)	(1,553)
Combined	£404	(£2,381)	(£1,977)	(£49,426)	(32,584)
D					
Leisure	£404	(£1,218)	(£815)	(£20,369)	(13,429)
Culture	(£250)	(£1,340)	(£1,590)	(£39,760)	(26,212)
External works	£0	(£94)	(£94)	(£2,356)	(1,553)
Combined	£154	(£2,653)	(£2,499)	(£62,485)	(41,194)
E					
Leisure	£292	(£1,661)	(£1,369)	(£34,231)	(£22,567)
Culture	(£250)	(£1,340)	(£1,590)	(£39,760)	(£26,212)
External works	£0	(£93)	(£93)	(£2,356)	(£1,553)
Combined	£42	(£3,094)	(£3,052)	(£76,347)	(£50,333)

Figure 7.4 – Net Costs of Options

Option £000's	Capital Costs	Indicative Funding	Net Capital & Revenue Costs	NPV Capital & Revenue Costs	Rank
A	25,300	5,986	37,261	24,857	2
B	56,910	16,650	37,257	24,562	1
C	71,661	16,650	49,426	32,584	3
D	77,938	16,650	62,485	41,194	4
E	88,170	16,650	76,347	50,305	5

Option B, the like for like development project, will have the lowest net project costs of £37.3m (£24.6m NPV) and makes a compelling case for investing more than the minimum required in order to deliver more extensive leisure, cultural, health and other social outcomes for a smaller overall investment. Option C, the enhanced leisure and cultural offer, would have a higher net project cost £49.4m (£32.6m), although this option has the potential to generate more external funding to reflect the increased provision and outcomes delivered. The do minimum option has similar net overall costs to Option B of £37.3m (£24.9m NPV) and whilst the upfront costs are lower, [REDACTED]

[REDACTED].

In addition, Option C will deliver higher footfall levels than a do minimum option, and would result in additional social value outcomes, both in terms of more people leading more active lives (and the subsequent health benefits that can bring) but also the development of an integrated leisure and cultural destination for Hastings.

7.7.4 Income and Expenditure Assumptions

Appendix 3 details leading assumptions for the financial modelling and should be read in conjunction with this strategic report.

7.7.5 Funding and Affordability

Significant capital investment is required to fund the redevelopment of the facilities. The expectation is that the majority of the project will be funded by the Council by way of a long-term loan, with [REDACTED] and funding partners providing grants to support the wider social value benefits the project will deliver.

Based on the preferred Option C, the capital costs to be financed are £71.7m. This will be funded by the proceeds of the [REDACTED], external grants (£1m), and a 40-year Public Works Loan Board loan of £55.0m with a fixed interest rate of 3.00%.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Each revenue stream has been discounted under Green Book Guidance using a discount rate factor of 3.5%.

7.7.6 Sensitivity Analysis

To take into account the risks of interest rates rising in the period before the project commences and the funding is drawn down, a higher interest rate of 4% for the loan has been modelled.

The impact of a higher interest rate is that the costs of borrowing rise by around £7k per annum for every £1m of borrowings for each option. The financial impact is shown in Figure 7.5. Option A would now score higher

financially than the other options as the impact of the higher borrowing rate is lower due to the lower capital requirements of this option.

Figure 7.5 – Net Costs of Options with higher interest rate

Option £000's	Net Capital & Revenue Costs	NPV Capital & Revenue Costs	Rank
A	40,144	26,758	1
B	44,565	29,380	2
C	59,415	39,170	3
D	73,618	48,533	4
E	95,653	63,060	5

Whilst the net costs of the refurbishment project are projected to be lower overall with the higher interest rate, it should be noted that these capital costs for the refurbishment of the leisure centre and theatre are based on high level estimated information that the Consultant Team have not been party to preparing or have been assessed in detail by the Council's team. Neither of the facilities have had detailed condition surveys and it is highly likely the refurbishment costs would increase once more detailed survey work is carried out.

In addition, the do minimum option, whilst scoring higher on the higher interest rate financial profile, will not deliver on Hastings' wider regeneration and tourism aspirations for Bohemia or the wider town, nor its carbon reduction targets. The difference between refurbishing outdated facilities and delivering new build, efficient facilities is only £4.4m over 25 years (£2.6m in NPV terms) which, given the wider social value and regeneration impact on Hastings the latter would offer, is considered by the Consultant Team to offer good value for money.

7.8 Management case

7.8.1 Introduction

This section of the OBC sets out how the project will be managed and successfully delivered in accordance with recognised best practice, both during planning and implementation and once the new venues open under new management arrangements.

7.8.2 Programme and project management

The Bohemia development project will need to be managed by a dedicated project team within the Council led by a Senior Council Officer.

There will need to be separate teams managing the development project and the procurement of the new management arrangements, supported by colleagues from within legal, finance, procurement and property departments. These teams will be assisted by suitably experienced specialist external advisors in areas such as design, technical services, procurement and legal.

Detailed delivery plans will be developed for each stage of the programme, including:

- o Detailed development of the design brief
- o Planning approvals
- o Procurement and mobilisation of the new management arrangements
- o Procurement of the redevelopment works contracts
- o Planning the phasing of works to minimise disruption to users

7.8.3 Approach to management and delivery of benefits

The new management arrangements will be outcome focused and will contain a clear benefits realisation plan that has been agreed by the Council. The venue operator's performance will be measured by the Council against the delivery of these benefits, which will be quantifiable and measurable.

Benefits to be agreed and measured will be defined during the procurement process and are likely to cover the following areas:

- o Increase in usage of the facilities overall and by key groups and demographics, such as young people
- o Increase in physical activity rates in Hastings
- o Increase in user satisfaction levels
- o Increased tourism spends within Hastings
- o Wider social value benefits

7.8.4 Post implementation evaluation arrangements

The Council will implement an appropriate performance management regime, with the venue operators tasked with providing the Council with regular information about their performance against defined outcomes and targets. This performance information will be agreed with the Council prior to contract commencement and subject to regular review to ensure it remains appropriate and relevant to the strategic priorities of the Council.

Where there are concerns regarding the operators' performance in delivering the defined outcomes and targets, the contracts will contain provisions to enable the Council to take action to protect its investment and the needs of users.

The contracts will also contain provisions allowing the Council to work with the operators to flex the services to better reflect changing user needs and the strategic priorities of the Council.

7.8.5 Contingency arrangements

The operating contracts will contain standard provisions to deal with a failure in the operators including step in rights, termination, re-tendering and compensation arrangements, to ensure there is continuity of service provision and minimal impact on the users.

8. Summary

It is clear from this strategic report and the overall options appraisal that investment into replacement facilities for Summerfields Leisure Centre and the White Rock Theatre should be the focus for the Council. The leisure and cultural offer at these facilities for Hastings residents is not only of a poor standard but the potential for significant future costs of maintaining and upgrading the current sub-standard facilities will soon become a reality for the Council.

The strategic report has set out the leading options for consideration and the financial appraisal focusing on the full delivery costs from a capital, revenue and financing perspective.

The starting point for the Council is clearly to examine the overall affordability of such a large-scale project and redevelopment of these two important facilities. There is also a notable amount of uncertainty at this stage over the full extent of enabling works for such a complex site. Our leading site option, at present, attempts to reduce some of that risk with

The Consultant Team have demonstrated that the provision of a new Leisure Centre and entertainment venue, alongside significant enhancements to the open space and opportunities for community activity at the site, can be a deliverable aspiration for Hastings Borough Council. The extent to which that leisure offer, particularly around extended water space and leisure waters, and the cultural offer, notably around the extended arts centre, will be dependent on the assessment by the Council on the affordability and opportunities to reduce the funding

gap set out in the initial financial analysis presented in this strategic report.

Whilst any decisions regarding the potential redevelopment of a new leisure centre, facilities and a cultural venue for Hastings will be governed by financial viability and affordability, the wider community benefit and the ability of the site to play an increased role in helping the Council meet aspirations across a wide range of agendas should not be overlooked. Investment into community facilities will support the Council's work towards their own corporate aims and ambitions and also provide the regeneration of a key area that can have a lasting, long-term impact on strategic objectives. It is important for the Council to continue to engage the various key partners and organisations to ensure a continued strategic alignment with appropriate objectives.

The wider value of participation in leisure and culture is recognised across a range of policy areas, including health, crime, education, employment and regeneration. Bohemia already accommodates strategically important facilities within Hastings, and it is essential to ensure that it can continue to support the work of a range of local and national partners. The study site has the potential to support a sustained increase in the quality, quantity and breadth of leisure and culture and the arts for local people. Engaging a wide range of partner organisations that can potentially support aspects of the capital development, as well as the delivery of quality opportunities, will be of great benefit to the leisure and cultural landscape.

The Consultant Team are of the opinion that the opportunities for securing external funding for leisure, sport, culture, skills, health and education will be present for the Council alongside the wider regeneration funding opportunities linked to the town's redevelopment. The significant contribution by these two facilities and the development of this priority site within Hastings to a wide range of priorities for

national partners requires further exploration and work by the Council. It should also be noted that further work by the Council is required to gain greater clarity on the [REDACTED]

[REDACTED]. The level of capital input that the Council can directly (or indirectly) contribute or gain from development (and funding) will have a marked impact on the level of provision for leisure and culture that the Council can meet for the Bohemia site and for Hastings overall.

The future of the Bohemia Masterplan and the evident priorities and needs for the provision of improved leisure and cultural facilities will require some key actions and decisions to be taken by Hastings Borough Council building on the evidence and initial direction provided within this strategic report. The Consultant Team consider that the main issues and key challenges associated with the overall project, and the actions that need to be taken to reduce the affordability gap in the first instance are all within the sphere of influence of the Council and it is clear that there is a desire to deliver an extended leisure, cultural and community offer within Bohemia and for Hastings that meets the needs and demands of a growing population and this evolving and developing town for many years to come. The Council is committed to investing in the future of Hastings and despite the key economic and budget challenges being faced in the public sector the proposals for the development of new leisure and culture facilities represent an exciting and achievable opportunity to deliver on that commitment.

Agenda Item 5



Agenda Item No:

Report to: Cabinet

Date of Meeting: 6 January 2020

Report Title: Treasury Management Mid-Year Report 2019-20

Report By: Peter Grace
Chief Finance Officer

Purpose of Report

This report advises the Cabinet of the Treasury Management activities and performance during the current year. It provides the opportunity to review the Treasury Management Strategy and make appropriate recommendations to Council to take account of any issues or concerns that have arisen since approving it in February 2019.

Recommendation

Cabinet agree the Mid-Year report.

Reasons for Recommendations

The Code of Practice on Treasury Management requires, as a minimum, a mid-year review of the Treasury Management Strategy and performance. This is intended to highlight any areas of concern that have arisen since the original strategy was approved (February 2019). It is a requirement of the Code of Practice that the Mid-year review is considered by Cabinet and full Council.

Background

1. The Council operates a balanced budget, which broadly means cash raised during the year will meet its cash expenditure in combination with funding from reserves. Part of the treasury management operations ensure this cash flow is adequately planned, with surplus monies being invested in low risk counterparties, providing adequate liquidity initially before considering optimising investment return.
2. The second main function of the treasury management service is the funding of the Council's capital plans. These capital plans provide a guide to the borrowing needs of the Council, essentially the longer term cash flow planning to ensure the Council can meet its capital spending operations. This management of longer term cash may involve arranging long or short term loans, or using longer term cash flow surpluses, and on occasion any debt previously drawn may be restructured to meet Council risk or cost objectives.
3. Accordingly, treasury management is defined as:

"The management of the local authority's investments and cash flows, its banking, money market and capital market transactions; the effective control of the risks associated with those activities; and the pursuit of optimum performance consistent with those risks."

Introduction

4. The Chartered Institute of Public Finance and Accountancy's (CIPFA) Code of Practice on Treasury Management (revised 2017) was adopted by this Council In February 2018.
5. The primary requirements of the Code are as follows:
 - Creation and maintenance of a Treasury Management Policy Statement which sets out the policies and objectives of the Council's treasury management activities.
 - Creation and maintenance of Treasury Management Practices which set out the manner in which the Council will seek to achieve those policies and objectives.
 - Receipt by the full council of an annual Treasury Management Strategy Statement - including the Annual Investment Strategy and Minimum Revenue Provision Policy - for the year ahead, a Mid-year Review Report and an Annual Report (stewardship report) covering activities during the previous year.
 - Delegation by the Council of responsibilities for implementing and monitoring treasury management policies and practices and for the execution and administration of treasury management decisions.
 - Delegation by the Council of the role of scrutiny of treasury management strategy and policies to a specific named body. For this Council the delegated body is the Audit Committee.
6. This mid-year report has been prepared in compliance with CIPFA's Code of Practice on Treasury Management, and covers the following:
 - An economic update for the first part of the 2019/20 financial year;

- A review of the Treasury Management Strategy Statement and Annual Investment Strategy;
 - The Council's capital expenditure (prudential indicators);
 - A review of the Council's investment portfolio for 2019/20;
 - A review of the Council's borrowing strategy for 2019/20;
 - A review of any debt rescheduling undertaken during 2019/20;
 - A review of compliance with Treasury and Prudential Limits for 2019/20.
7. The Committee will need to determine whether there are any issues that require the amendment of the Council's Treasury Management Strategy or Investment Policy and that they therefore wish to draw to the attention of Council.
8. The Council has increased its levels of income generation and this entails new borrowing over potentially long periods, with consequent risks in terms of asset valuations, credit worthiness, cash and reserve fund availability. Such risks cannot be considered in isolation of all the issues facing the Council now and potentially in the future
9. The Audit Committee will consider a similar report at their meeting on 22 January 2020.

Economic Update

10. **UK. Brexit.** 2019 has been a year of upheaval on the political front as Theresa May resigned as Prime Minister to be replaced by Boris Johnson on a platform of the UK leaving the EU on 31 October 2019, with or without a deal. However, MPs blocked leaving on that date and the EU agreed an extension to 31 January 2020.
11. In late October, MPs approved an outline of a Brexit deal to enable the UK to leave the EU on 31 January; however at the time of writing the general election on 12 December 2019 provides considerable uncertainty as to whether this will occur. Should it proceed a trade deal will need to be negotiated by the end of the transition period in December 2020.
12. While the Bank of England went through the routine of producing another quarterly Inflation Report, (now renamed the Monetary Policy Report), on 7 November, it is very questionable how much all the writing and numbers are worth when faced with the uncertainties of where the UK will be after the general election. The Bank made a change in their Brexit assumptions to now include a deal being eventually passed.
13. Possibly the biggest message that is worth taking note of from the Monetary Policy Report, was an increase in concerns among MPC members around weak global economic growth and the potential for Brexit uncertainties to become entrenched and so delay UK economic recovery. Consequently, the MPC voted 7-2 to maintain Bank Rate at 0.75% but two members were sufficiently concerned to vote for an immediate Bank Rate cut to 0.5%.
14. The MPC warned that if global growth does not pick up or Brexit uncertainties intensify, then a rate cut was now more likely. Conversely, if risks do recede, then a more rapid

recovery of growth will require gradual and limited rate rises. The speed of recovery will depend on the extent to which uncertainty dissipates over the final terms for trade between the UK and EU and by how much global growth rates pick up. The Bank revised its inflation forecasts down – to 1.25% in 2019, 1.5% in 2020, and 2.0% in 2021; hence the MPC views inflation as causing little concern in the near future.

15. If economic growth were to weaken considerably, the MPC has relatively little room to make a big impact with Bank Rate still only at 0.75%. It would therefore, probably suggest that it would be up to the Chancellor to provide help to support growth by way of a fiscal boost by e.g. tax cuts, increases in the annual expenditure budgets of government departments and services and expenditure on infrastructure projects, to boost the economy. The Government has already made moves in this direction and both of the largest parties have made significant promises in their election manifestos to increase government spending.
16. The Chancellor has also amended the fiscal rules in November to allow for an increase in government expenditure. In addition, it has to be borne in mind that even if the post-election Parliament agrees the deal on 31 January 2020, the current transition period for negotiating the details of the terms of a trade deal with the EU only runs until 31 December 2020. This could prove to be an unrealistically short timetable for such major negotiations which leaves open two possibilities; one the need for an extension of negotiations, probably two years, or a no deal Brexit in December 2020.
17. As for inflation itself, CPI has been hovering around the Bank of England's target of 2% during 2019, but fell again in October to 1.5%. It is likely to remain close to or under 2% over the next two years and so it does not pose any immediate concern to the MPC at the current time. However, if there was a no deal Brexit, inflation could rise towards 4%, primarily because of imported inflation on the back of a weakening pound.
18. With regard to the labour market, growth in numbers employed has been quite resilient through 2019 until the three months to September where it fell by 58,000. However, this was about half of what had been expected. The unemployment rate fell back again to a 44 year low of 3.8% on the Independent Labour Organisation measure in September, despite the fall in numbers employed, due to numbers leaving the work force.
19. Wage inflation has been edging down from a high point of 3.9% in July to 3.8% in August and now 3.6% in September, (3 month average regular pay, excluding bonuses). This meant that in real terms, (i.e. wage rates higher than CPI inflation), earnings grew by about 1.9%. As the UK economy is very much services sector driven, an increase in household spending power is likely to feed through into providing some support to the overall rate of economic growth in the coming months. The other message from the fall in wage growth is that employers are beginning to find it easier to hire suitable staff, indicating that supply pressure in the labour market is easing.

Interest rate forecasts

20. The Council's treasury advisor, Link Asset Services, has provided the following forecast. This forecast includes the increase in margin over gilt yields of 100bps introduced on 9 October 2019 in respect of the PWLB.

Interest rate Forecasts – December 2019 to March 2022

Link Asset Services Interest Rate View										
	Dec-19	Mar-20	Jun-20	Sep-20	Dec-20	Mar-21	Jun-21	Sep-21	Dec-21	Mar-22
Bank Rate View	0.75	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.25
3 Month LIBID	0.70	0.70	0.70	0.80	0.90	1.00	1.00	1.00	1.10	1.20
6 Month LIBID	0.80	0.80	0.80	0.90	1.00	1.10	1.10	1.20	1.30	1.40
12 Month LIBID	1.00	1.00	1.00	1.10	1.20	1.30	1.30	1.40	1.50	1.60
5yr PWLB Rate	2.30	2.50	2.60	2.70	2.70	2.80	2.90	3.00	3.00	3.10
10yr PWLB Rate	2.60	2.80	2.90	3.00	3.00	3.10	3.20	3.30	3.30	3.40
25yr PWLB Rate	3.30	3.40	3.50	3.60	3.70	3.70	3.80	3.90	4.00	4.00
50yr PWLB Rate	3.20	3.30	3.40	3.50	3.60	3.60	3.70	3.80	3.90	3.90

21. The above forecasts have been based on an assumption that there is some sort of agreed deal on Brexit at some point in time. Given the current level of uncertainties, this is a huge assumption and so forecasts may need to be materially reassessed in the light of events over the next few weeks or months.

The Council's Treasury Position – 30 September 2019

Borrowing

22. The Council's debt and investment position at the 30 September 2019 was as follows

Table 1 – Borrowing

Debt	1 April 2019 Principal	Rate	Maturity	30 Sept 2019 Principal	Rate
PWLB	£7,500,000	4.80%	2033	£7,500,000	4.80%
PWLB	£909,027	3.78%	2044	£909,027	3.78%
PWLB (Optivo)	£1,788,235	3.78%	2044	£1,788,235	3.78%
PWLB (FT) (Annuity)	£215,148	1.66%	2026	£200,592	1.66%
PWLB	£1,000,000	2.92%	2056	£1,000,000	2.92%
PWLB	£1,000,000	3.08%	2046	£1,000,000	3.08%
PWLB	£1,000,000	3.01%	2036	£1,000,000	3.01%
PWLB	£1,000,000	2.30%	2026	£1,000,000	2.30%
PWLB	£2,000,000	2.80%	2054	£2,000,000	2.80%
PWLB	£1,000,000	2.42%	2028	£1,000,000	2.42%
PWLB	£2,000,000	2.53%	2057	£2,000,000	2.53%
PWLB	£2,000,000	2.50%	2059	£2,000,000	2.50%
PWLB	£2,000,000	2.48%	2060	£2,000,000	2.48%
PWLB (Annuity)	£7,113,729	2.53%	2057	£7,058,607	2.53%
PWLB (Annuity)	£8,232,534	2.72%	2057	£8,172,600	2.72%
PWLB	£2,000,000	1.98%	2028	£2,000,000	1.98%

PWLB (Annuity)	£4,000,000	2.55%	2058	£3,970,946	2.55%
PWLB (Annuity)	£2,500,000	2.56%	2059	£2,481,883	2.56%
PWLB (Annuity)	£4,410,000	2.56%	2069	£4,388,015	2.56%
PWLB (Annuity)	£9,400,000	2.54%	2059	£9,331,568	2.54%
PWLB (Annuity)	-	-	2069	£4,800,000	1.83%
Total Debt	£61,068,673	2.90%		£65,601,473	2.82%

23. At the 30 September 2019 the Council had debt amounting to £65.6m (PWLB debt).
24. The Council's underlying need to borrow for capital expenditure is termed the Capital Financing Requirement (CFR). This figure is a gauge of the Council's debt position. The CFR results from the capital activity of the Council and what resources have been used to pay for the capital spend.
25. Part of the Council's treasury activities is to address the funding requirements for the Council's borrowing need. Depending on the capital expenditure programme, the treasury service organises the Council's cash position to ensure sufficient cash is available to meet the capital plans and cash flow requirements. This may be sourced through borrowing from external bodies (such as the Government, through the Public Works Loan Board [PWLB] or the money markets), or utilising temporary cash resources within the Council.
26. The Council's underlying borrowing need (CFR) is not allowed to rise indefinitely. Statutory controls are in place to ensure that capital assets are broadly charged to revenue over the life of the asset. The Council is required to make an annual revenue charge, called the Minimum Revenue Provision – MRP, to reduce the CFR. This is effectively a repayment of the borrowing need. This differs from the treasury management arrangements which ensure that cash is available to meet capital commitments. External debt can also be borrowed or repaid at any time, but this does not change the CFR.
27. The total CFR can also be reduced by:
- the application of additional capital financing resources (such as unapplied capital receipts); or
 - charging more than the statutory revenue charge (MRP) each year through a Voluntary Revenue Provision (VRP).
28. The Council's 2019/20 MRP Policy was approved as part of the Treasury Management Strategy Report for 2019/20 by Council in February 2019.
29. The Council's CFR for the year is shown below, and represents a key prudential indicator. It includes leased items on the balance sheet, which increase the Council's borrowing need (albeit no additional borrowing is actually required against such items).

Table 2 CFR: General Fund	2018/19 Actual £000's	2019/20 Estimate £000's
Opening balance	39,493	58,094
Add unfinanced capital expenditure	19,396	15,662
Less MRP	(795)	(1,184)
Closing balance	58,094	72,572

30. Borrowing activity is constrained by prudential indicators for net borrowing and the CFR, and by the authorised limit.
31. The Council's long term borrowing must only be for a capital purpose. This essentially means that the Council is not borrowing to support revenue expenditure. Net borrowing should not therefore, except in the short term, have exceeded the CFR for 2019/20 plus the expected changes to the CFR over 2020/21 and 2021/22 from financing the capital programme. This indicator allows the Council some flexibility to borrow in advance of its immediate capital needs in 2019/20.

Table 3 Internal Borrowing	2018/19 Actual £000's	2019/20 Estimate As at 30/11/19 £000's
Capital Financing Requirement	58,094	72,572
External Borrowing	61,069	65,601
Net Internal Borrowing	(2,975)	6,971

32. The table above highlights the Council's gross borrowing position against the CFR, which provides an indication of affordability for the Council. The Council has complied with this prudential indicator.

Investments in 2019-20

33. The table below provides a snapshot of the investments and deposits held on 30 September 2019. The level of investments can fluctuate significantly on a day to day basis, given the level of funding received, precept payments, grants payable and receivable, salaries and wages, etc.

Table 4 – Investments and deposits

Counterparty	Rate/ Return	Start Date	End Date	Principal	Term
Landesbank - Helaba	1.14%	30/01/2019	30/01/2020	5,000,000	Fixed
Australia & NZ BGC Ltd	0.98%	03/06/2019	03/12/2019	5,000,000	Fixed
DBS Bank	0.79%	04/07/2019	04/10/2019	5,000,000	Fixed
Credit Agricole	0.79%	03/09/2019	03/03/2020	5,000,000	Fixed
Goldman Sachs	0.92%	11/09/2019	11/03/2020	5,000,000	Fixed
Barclays Corporate	0.40%			1,999,995	Call
NAT West	0.05%			6,147	Call
			Total	27,006,142	

34. As at 30 September 2019 three longer term loans are outstanding to other organisations.

Table 5 – Loans to Other Organisations

3rd Party Organisations	Rate/ Return (%)	Start Date	End Date	Principal £	Term
Amicus /Optivo	3.78%	04/09/2014	02/09/2044	£1,788,235	Fixed
The Foreshore Trust	1.66%	21/03/2016	20/03/2026	£200,592	Annuity
The Source	2.43%	17/12/2015	16/12/2024	£18,123	Annuity
			Total	£2,006,950	

35. Borrowing from the PWLB was taken to fund the Amicus Horizon (now Optivo) loan (£1,788,235- Maturity loan) and the loan to the Foreshore Trust (£300,000 originally borrowed – Annuity loan); these correspond to PWLB loans in Table 1 above.
36. The overall investment performance for the first 6 months of 2019/20 provided an average return of 0.91% (2018/19 0.78%).
37. The total interest receivable for the first 6 months is £120,348 (2018/19 £82,944) These figures exclude the interest receivable in respect of the three loans to other organisations and income from the Property Fund investment.

Loans to Hastings Housing Company Ltd

38. Hastings Housing Company has two loans outstanding with the council, a revenue loan and a capital loan. The rate chargeable on the revenue loan is calculated monthly and stood at 4.84% at the end of September 2019. The Capital loan rate is based on the rate prevailing at the time of the advance and is fixed for the period of the loan. The value of the revenue loan was £94,000 and for the capital loan £5,492,000 at the end of September. The interest rates are determined in accordance with EU rules. The company expects to be able to repay the revenue loan in full at the year end. Currently

the debt costs incurred by the Council in making advances to the housing company are covered by the interest repayments.

The Council's Capital Position (Prudential Indicators)

39. This part of the report is structured to update:

- The Council's capital expenditure plans;
- How these plans are being financed;
- The impact of the changes in the capital expenditure plans on the prudential indicators and the underlying need to borrow; and
- Compliance with the limits in place for borrowing activity.

Prudential Indicator for Capital Expenditure

40. This table shows the revised estimates for capital expenditure for 2019/20.

Table 6 Capital Expenditure (Net) by Service	2019/20 Original Estimate (net) £'000	2019/20 Revised Estimate (net) £'000
Corporate Resources	5,492	6,986
Operational Services	11,164	8,676
Total Capital Expenditure	16,656	15,662

Capital Expenditure – Financing

41. The new Capital schemes, approved since the budget, will generally be financed by borrowing, unless Capital receipts from the sale of assets are available.

42. The larger schemes in the capital programme which are expected to require financing in 2019/20 from borrowing are:-

- (1) Commercial property purchases estimated at £6.09m
- (2) Loans to Hastings Housing Company Ltd estimated at £4.3m
- (3) Temporary accommodation estimated at £2.3m
- (4) DSO Vehicles and depot works at £1.08m
- (5) Conversion of 12/13 York buildings at £654,000
- (6) Country Park Visitors Centre estimated at £308,000

Impact on the prudential indicators

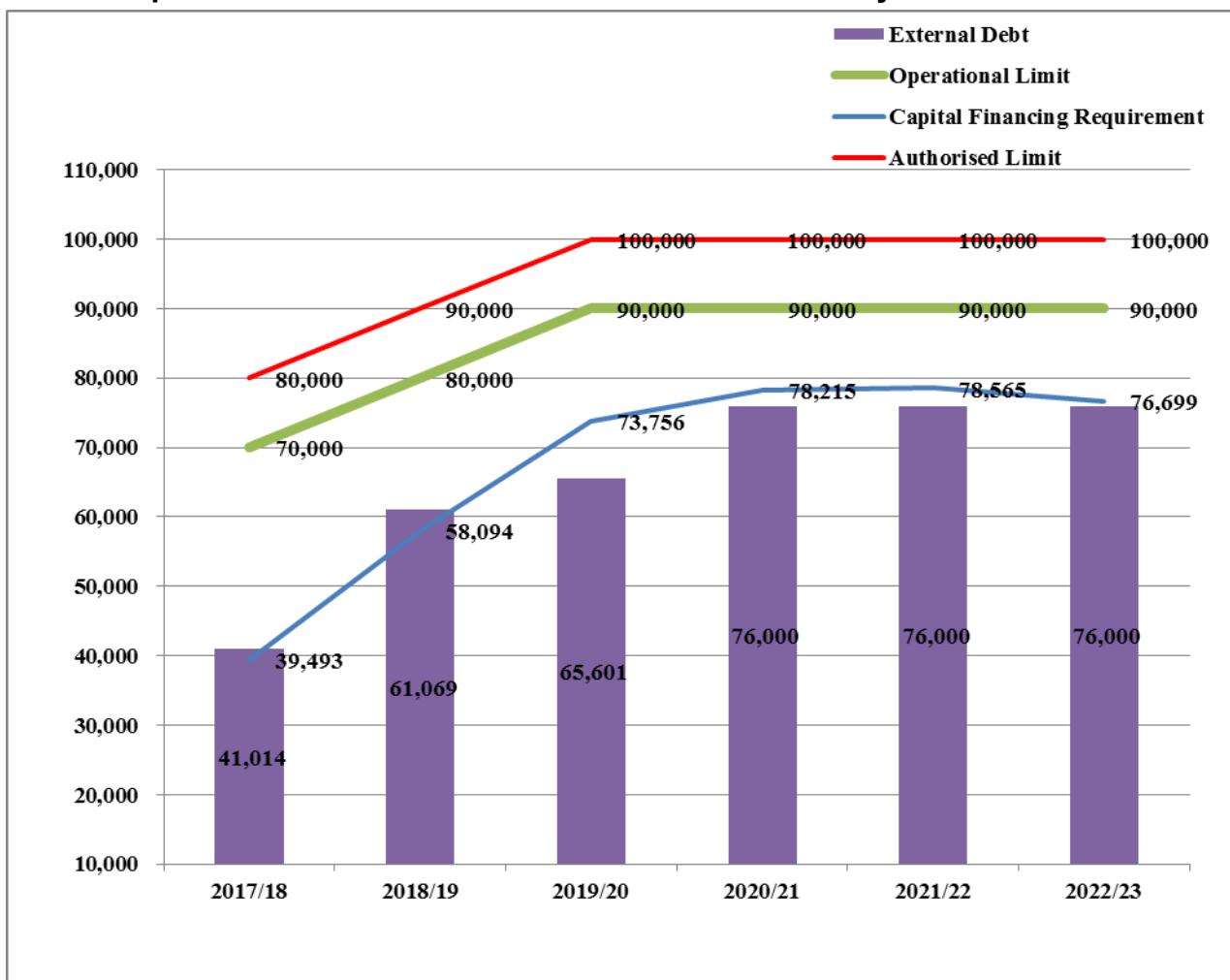
43. The Capital Financing Requirement has increased significantly over the last 18 months. It is expected to reach some £96m by April 2021. The position at 30 November 2019 is shown in Table 3 above, and highlights that there would be an underlying financing requirement of some £6.9m by the year end if no further borrowing is undertaken in 2019/20.

Compliance with the limits in place for borrowing activity.

44. The first key control over the treasury activity is a prudential indicator to ensure that over the medium term, net borrowing (borrowings less investments) will only be for a capital purpose. Gross external borrowing should not, except in the short term, exceed the total of CFR in the preceding year plus the estimates of any additional CFR for 2019/20 and next two financial years.
45. A further prudential indicator controls the overall level of borrowing. This is the Authorised Limit which represents the limit beyond which borrowing is prohibited, and needs to be set and revised by Members. It reflects the level of borrowing which, while not desired, could be afforded in the short term. It is the expected maximum borrowing need with some headroom for unexpected movements. This is the statutory limit determined under section 3 (1) of the Local Government Act 2003.
46. The current operational and authorised boundaries are as follows. They will need to be revised for 2020/21 and beyond given planned expenditure. Revised limits will be considered when determining the Treasury management Strategy for 2020/21 in February 2020 (A full Council decision).

Table 7	2019/20	2020/21	2021/22
TREASURY MANAGEMENT PRUDENTIAL INDICATORS	£'000	£'000	£'000
Authorised Limit for external debt - borrowing other long term liabilities TOTAL	£95,000 £5,000 £100,000	£95,000 £5,000 £100,000	£95,000 £5,000 £100,000
Operational Boundary for external debt - borrowing other long term liabilities TOTAL	£85,000 £ 5,000 £90,000	£85,000 £ 5,000 £90,000	£85,000 £ 5,000 £90,000

Graph: Estimated CFR/ Debt and Debt boundaries at year end



Borrowing Strategy

47. The Council now has some £65.6m of PWLB debt, and could potentially borrow up to a level of £73.7m (estimated CFR at 31 March 2020). This figure does not take account of any new capital spending in future years which could potentially be funded by new borrowing.
48. The interest rate forecasts from the Council's treasury advisers identify that it is unlikely that the base rate will increase until later in 2020. Whilst the borrowing rates are attractive on a historical basis the difference between the return on investment and the cost of borrowing remains – the additional revenue cost falling on the Council taxpayer.
49. New borrowing has been taken over the last 18 months, to not only take advantage of the historically low rates, but to ensure that the Council's own reserves are cash backed should restrictions be placed on the amount and levels of borrowing that authorities can undertake (particularly from the PWLB) and a balanced view will continue to be taken. This strategy was well founded given the 1% increase in borrowing rates from the PWLB in October 2019.

50. The Council's corporate plans require substantial new borrowing by the Council in the future and play a part in the consideration as to when to borrow and the level of internal borrowing. Given the historically low interest rates and the ability of the Council to look at other investment opportunities which are providing higher returns than the cost of borrowing e.g. property funds, there has been a much stronger case for reducing the level of internal funding in order to ensure a lower level of borrowing risk in the future.
51. On 9 October 2019 the PWLB announced it was increasing rates on new loans by 100bps (1%) with immediate effect. At the time this increased the cost of a 40 year annuity loan from 1.88% to 2.88%, an increase of 53% in the rate of interest payable. Despite the increase interest rates still remain at historically low levels. However the council will now consider other sources of borrowing when making financing decisions to ensure loans are obtained at the most advantageous rates possible.

Debt Rescheduling

52. The Council keeps under review the potential for making premature debt repayments in order to reduce borrowing costs as well as reducing counterparty risk by reducing investment balances. However, the cost of the early repayment premiums that would be incurred and the increase in risk exposure to significantly higher interest rates for new borrowing, continue to make this option unattractive. When reviewed on the 27 September 2017 the early repayment cost of the £7.5m (4.8%) PWLB loan, maturing in 2033, would amount to £3,177,343. No debt rescheduling is being contemplated at present as the interest rate differences are similar to that of two years ago.

Investment Strategy

53. Priority is given to security and liquidity of investments in order to reduce counterparty risk to the maximum possible extent.
54. The Council has a limit of £5m with any one institution (rated A or above, supported by Government, and given a blue (12 month) rating by Link Asset Services). This generally represents a level of up to 15% of the investment portfolio with any one institution or group at any one time. It is also necessary, at times, to invest sums of this size in order to attract the larger institutions which have the higher credit ratings.
55. The Eurozone and Brexit have led to a number of downgrades to banks' credit ratings, making it increasingly difficult to spread investments across a number of institutions. The Chief Finance Officer has the authority to amend the limits if necessary to ensure that monies can be placed with appropriate institutions.
56. The net cost to the Council of borrowing, investment interest and fees will be reviewed as part of the budget setting process.

Property Fund

57. It was agreed in February 2017 that the option for diversification of some of the investments into a property fund be undertaken with CCLA in the sum of £2m. The investment being in respect of the Council's reserves that are not required for a period

of at least 5 years in order that any fall in values and entry costs into such funds can be covered. The £2m was invested in April 2017 and the performance is detailed below:

CCLA – LA's Property Prices and Dividend yields

End of	Sep-19	Jun-19	Mar-19	Dec-18	Sep-18	Jun-18	Mar-18	Dec-17	Sep-17	Apr-17
Offer Price p	324.35	327.66	327.40	329.35	324.17	324.10	322.40	319.44	314.48	307.19
Net Asset Value p	303.84	306.94	306.70	308.53	303.67	303.61	302.01	299.24	294.60	287.77
Bid Price p	299.13	302.19	301.95	303.75	298.97	298.90	297.33	294.60	290.03	283.31
Dividend* on XD Date p	3.45	3.15	3.31	3.32	3.17	3.28	3.21	3.38	3.34	
Dividend* - Last 12 Months p	13.22	12.94	13.08	12.98	13.04	13.64	13.70	13.71	13.13	13.19
Dividend Yield on NAV %	4.35	4.22	4.26	4.21	4.29	4.49	4.54	4.58	4.46	4.58
Fund Size £m	1,173.1	1,178.2	1,127.1	1,099.0	1,047.8	1,027.7	976.3	930.8	836.2	710.2

58. The dividend yield is around 4.4% on the net asset value, which results in quarterly cash dividends of around £22,000. Full year dividends are estimated at around £86,000.

Property Fund Capital Value

Units (651,063)	Sep-19	Jun-19	Mar-19	Dec-18	Sep-18	Jun-18	Mar-18	Dec-17	Sep-17	Apr-17
Mid Market Price (£)	1,978,190	1,998,373	1,996,810	2,008,725	1,977,083	1,976,692	1,966,275	1,948,241	1,918,032	1,873,564
Bid Price (£)	1,947,525	1,967,447	1,965,885	1,977,604	1,946,483	1,946,027	1,935,806	1,918,032	1,888,278	1,844,527

59. The Capital value has increased by some 5.58% between April 2017 and September 2019 and that trend is currently continuing. It is important that this is continued to be viewed as a longer term investment (5 years plus) if the original Capital value is to be recovered.

Diversified Income Fund

60. It was agreed in February 2019 that a sum of £3m would be made available for further diversification of the Council's investments. £1m was invested on 26 July 2019 and a further £2m investment was made on 24 September 2019 into the CCLA Diversified Income Fund. Anticipated returns were around 3% with the added advantage of much higher liquidity than the property fund.
61. The capital value has already recovered from the initial investment where charges are effectively deducted, and was valued at £2,999,815 at the end of November 2019. Dividend yield is 3.17% for November (3.2% October). It should be remembered that this is a long term investment and prices can go up and down.

Compliance with Treasury Limits

62. During the financial year to date there have again been a few occasions where it has not been possible to find institutions to take the Council's money given the strict criteria in place. In these circumstances the Council will place money in its existing call accounts and this can thus result in the investments exceeding general limits. Where such an occasion looks likely to arise the approval of Chief Finance officer is required in compliance with the Council's Treasury Management Practices. The Prudential Indicators have been complied with - reproduced in Appendix 1 for reference.

Financial Implications

63. The Council's 2019/20 budget estimated a 0.75% return on investments. With the Bank Base Rate remaining unchanged since August 2018 interest rates on investments have not changed significantly. The Council's actual average rate of return to 30 September was slightly better than budgeted at 0.91% (excluding Property Fund and other loans made).

Future Changes

64. The Treasury Management Code of Practice (Cipfa) and the Prudential Code for Capital Finance were revised in late 2017/18, and the requirement for a new strategic planning document introduced – the “Capital Strategy” which seeks to bridge the perceived gaps in understanding between the Capital programme, funding thereof and Treasury Management. This was agreed by full council in February 2019 and will be reviewed and updated annually.
65. The 2020/21 Treasury Management Strategy suite of reports will be considered by the Audit Committee on the 22 January 2020 and thereafter considered by Cabinet and then by full Council on 19 February 2020 in conjunction with the budget papers.

Risk Management

66. The additional risks that the Council is taking on with commercial property, housing and energy investments will need to be considered in the context of the totality of risk that the Council faces e.g. rates revaluation, robustness of income streams, economic downturns, etc. Where there is more risk and volatility in income streams the Council will need to ensure that it maintains sufficient reserves to ensure the Council's ability to deliver key services is not jeopardised.
67. The Council spreads its risk on investments by limiting the amount of monies with any one institution or group and limiting the timeframe of the exposure. In determining the level of the investment and period the Council considers formal credit ratings (Fitch) along with its own advisers (Link Asset Services) ratings advice.
68. The security of the principal sum remains of paramount importance to the Council.
69. To date the strategy of externalising debt has been successful, particularly in the light of the sudden PWLB rate increase in October 2019. The investments made in the Property Fund (CCLA) and the Diversified Investment Fund (CCLA), totalling £5m are currently showing good returns. The risks currently faced in achieving a sustainable Council budget mean that no further long term investments can be made.

Timetable of Next Steps

1. Please include a list of key actions and the scheduled dates for these:

Action	Key milestone	Due date (provisional)	Responsible
Review and revise Annual Treasury Management Strategy	Setting of 2020/21 Budget	February 2020	Chief Finance Officer
Treasury Management Outturn Report to Cabinet	Close of 2019/20 accounts	July 2020	Chief Finance Officer

Wards Affected

Ashdown, Baird, Braybrooke, Castle, Central St. Leonards, Conquest, Gensing, Hollington, Maze Hill, Old Hastings, Ore, Silverhill, St. Helens, Tressell, West St. Leonards, Wishing Tree

Area(s) Affected

Central Hastings, East Hastings, North St. Leonards, South St. Leonards

Implications

Relevant project tools applied? Yes

Have you checked this report for plain English and readability? Yes. This has been done as far as possible considering the complex financial issues involved. Flesch-Kincaid grade level 34.4.

Climate change implications considered? N/A

Please identify if this report contains any implications for the following:

Equalities and Community Cohesiveness	No
Crime and Fear of Crime (Section 17)	No
Risk Management	Yes
Environmental Issues	No
Economic/Financial Implications	Yes
Human Rights Act	No
Organisational Consequences	No
Local People's Views	No
Anti-Poverty	No

Additional Information

Appendix 1: Prudential Indicators

Officer to Contact

Peter Grace
pgrace@hastings.gov.uk
Chief Finance Officer
01424 451503

APPENDIX 1

This page is intentionally left blank

APPENDIX 1 Prudential Indicators

The Council's Capital expenditure plans are the key driver of treasury management activity. The output of the Capital expenditure plans (detailed in the budget) is reflected in the prudential indicators below.

TREASURY MANAGEMENT PRUDENTIAL INDICATORS	2017/18*	2018/19	2019/20	2020/21	2021/22
Authorised Limit for external debt	£'000	£'000	£'000	£'000	£'000
Borrowing	£75,000	£85,000	£95,000	£95,000	£95,000
other long term liabilities	£5,000	£5,000	£5,000	£5,000	£5,000
TOTAL	£80,000	£90,000	£100,000	£100,000	£100,000
Operational Boundary for external debt -					
borrowing	£65,000	£75,000	£85,000	£85,000	£85,000
other long term liabilities	£5,000	£5,000	£5,000	£5,000	£5,000
TOTAL	£70,000	£80,000	£90,000	£90,000	£90,000

2017/18* - proposed revision to authorised boundary from £70m to £80m. Operational boundary unaltered.

Interest Rate Exposures	2018/19	2019/20	2020/21
	Upper	Upper	Upper
Limits on fixed interest rates based on net debt	100%	100%	100%
Limits on variable interest rates based on net debt	100%	100%	100%
Limits on fixed interest rates:			
· Debt only	100%	100%	100%
· Investments only	100%	100%	100%
Limits on variable interest rates			
· Debt only	30%	30%	30%
· Investments only	100%	100%	100%
Maturity Structure of fixed interest rate borrowing 2018/19			
		lower	Upper
Under 12 Months		0%	100%
12 months to 2 years		0%	100%
2 years to 5 years		0%	100%
5 years to 10 years		0%	100%
10 years to 20 years		0%	100%
20 years to 30 years		0%	100%
30 years to 40 years		0%	100%
40 years to 50 years		0%	100%
Maturity Structure of variable interest rate borrowing 2018/19			
		lower	Upper
Under 12 Months		0%	30%
12 months to 2 years		0%	30%
2 years to 5 years		0%	30%
5 years to 10 years		0%	30%
10 years to 20 years		0%	10%
20 years to 30 years		0%	10%
30 years to 40 years		0%	10%
40 years to 50 years		0%	10%

Affordability prudential indicator - Ratio of financing costs to net revenue stream

This indicator assesses the affordability of the capital investment plans. It provides an indication of the impact of the capital investment plans on the Council's overall finances. This indicator identifies the trend in the cost of capital (borrowing and other long term obligation costs net of investment income) against the net revenue stream.

Prudential Indicator: Financing Cost to Net Revenue Stream	2017/18 Actual	2018/19 Rev.Est	2019/20 Estimate	2020/21 Estimate	2021/22 Estimate
Financing Costs	£'000	£'000	£'000	£'000	£'000
1. Interest Charged to General Fund	925	1,366	1,983	2,296	2,394
2. Interest Payable under Finance Leases and any other long term liabilities	-	-	-	-	-
3. Gains and losses on the repurchase or early settlement of borrowing credited or charged to the amount met from government grants and local taxpayers	-19		0	0	0
4. Interest and Investment Income	-305	-366	-553	-834	-1,062
5. Amounts payable or receivable in respect of financial derivatives	-	-	-	-	-
6. MRP, VRP	717	795	1,184	1,628	1,775
6. Depreciation/Impairment that are charged to the amount to be met from government grants and local taxpayers	-	-	-	-	-
Total	1,318	1,795	2,614	3,090	3,107
Net Revenue Stream					
Amount to be met from government grants and local taxpayers	13,373	13,034	13,034	13,389	13,673
Ratio					
Financing Cost to Net Revenue Stream	10%	14%	20%	23%	23%

This prudential indicator shows that the ratio of financing costs to the net revenue stream is increasing. This is not unexpected given that the Council has an income generation strategy that has identified an additional £50m of Capital expenditure over the period 2017/18 to 2020/21. The above ratio does not take into account the income that will be generated from the energy initiatives and commercial property acquisitions.

Other Prudential Indicators

Internal Borrowing and Gearing ratios for the authority are included in the Capital Strategy. Additional prudential indicators will be developed as the forward capital plans of the authority are developed.

This page is intentionally left blank

Agenda Item 6



Report to: Cabinet

Date of Meeting: 6th January 2020

Report Title: Town Deal

Report By: Victoria Conheady
Assistant Director, Regeneration and Culture

Purpose of Report

Hastings is one of the only 101 towns eligible to bid for up to £25 million from the Town Fund which was launched by the government in November 2019. This report sets out the purpose of the fund, and both the partnership and work arrangements which need to be put in place to access the Town Fund.

This is a significant opportunity to help kick-start the next phase of Hastings' regeneration using the drawdown of the Town Fund and leveraging of other public and private investment to maximise its impact.

The report seeks both support for the 'direction of travel' and authority to spend up to £173,029 'capacity' funding in delivering a successful town bid.

Recommendation(s)

1. To delegate authority to the Director of Operational Services or his nominee in consultation with the Lead Member for Regeneration and Culture to:
 - Establish a Town Board and agree its membership with the relevant partners including with local businesses and the community.
 - To procure services and expertise to develop a Town Investment Plan and agree the Town Deal using the £173,029 awarded by the government to support this initiative.
 - To establish a project team to oversee the development of the plans and its implementation in conjunction with the County Council and other partners as appropriate.

Reasons for Recommendations

1. The government recently launched the Towns Fund with the objective of driving the economic regeneration of towns such as Hastings and delivering long term economic and productivity growth. The Towns Fund will provide up to £25 million public investment by central government through the agreement of a Town Deal.
2. There is also the possibility of additional funding which may come from other sources or branches of government and private investment, to support the implementation of a Town Deal. It offers an opportunity for Hastings to address many of the remaining social and economic challenges in the town as a whole.

Introduction

1. The government announced the launch of the Town Fund on 6th September 2019. It published the prospectus for the fund on 1st November 2019, inviting 101 towns to develop proposals for a Town Deal, as part of the £3.6 billion Fund. The Fund will provide towns with the tools to design and deliver a growth strategy for their area.
2. Hastings is one of the eligible towns and the Fund will provide up to £25 million public investment through the agreement of a Town Deal. It is anticipated additional public funding opportunities will be aligned to the objectives of the Town Deal, for example, a Town Deal could be part funded by the Town Fund, National Lottery Funds, Arts Council England, Shared Prosperity Fund, other grants and private investment sources etc.
3. The final Town Deal agreed with the government will depend on comprehensive regeneration plan for Hastings for which the Town Fund provides an element of public investment.
4. It is expected that the agreed Town Deal will be an important strategic and a ‘call for action’ document for the council and partners for the next five to ten years. It will represent our vision, ambition, corporate priority and a significant amount of our resource commitment over the short and medium term. It will also join up many of the ‘asks’ in our Local Plan, Corporate Plan and our various strategies including the Anti-Poverty Strategy, Housing Strategy and the Climate Change Strategy. It will be our ‘go to’ document mapping out our ambitions for the future in concrete programmes of activity. It will also be our prospectus to funders and investors showing Hastings is open for business.
5. It will deliver jobs, homes, skills and action to reduce our carbon emissions. It must include activities which ensure residents in the outer areas of the town directly benefit from the proposed investment.
6. Seven towns in the South East LEP area can bid for the Towns Fund; being Colchester, Grays, Harlow, Hastings, Margate, Newhaven and Tilbury.
7. The attached link provides further information to the Town Fund prospectus:
<https://www.gov.uk/government/publications/towns-fund-prospectus>
8. The government has also indicated that further guidance will be published on the fund sometime in early January 2020.

Objective of Town Fund

9. The objective of the Fund is to drive the economic regeneration of towns to deliver long term economic and productivity growth through:
 - I. **Urban regeneration, planning and land use:** ensuring towns are thriving places for people to live and work, including by increasing density in town centres; strengthening local economic assets including local cultural assets; site

acquisition, remediation, preparation, regeneration; and making full use of planning tools to bring strategic direction and change

- II. **Skills and enterprise infrastructure:** driving private sector investment and ensuring towns have the space to support skills and small business development
- III. **Connectivity:** developing local transport schemes that complement regional and national networks, as well as supporting the delivery of improved digital connectivity.

Preparing for a Town Deal

10. This first part of the Town Deal has a 2 stage process:

- **Stage 1:** Convene a board; work with the community to develop a well-evidenced Town Investment Plan. This will set out a clear understanding of the area, focusing on its assets, opportunities and challenges.
- **Stage 2:** Use Town Investment Plan to develop business case(s) to apply for funding for interventions (further guidance to be issued in early 2020).

11. HBC has been provided with £173,029 ‘capacity funding’ to prepare for the town deal and to deliver the following:

- A. Convene Town Deal Board
- B. Run business and wider community engagement events
- C. Develop Town Investment Plans
- D. Commission technical expertise for business case development.

12. It is proposed to procure the support of experienced consultant and technical expertise to develop the programme. The ‘capacity funding’ will be used to both employ a company with the range of experience to deliver the above and to cover additional HBC internal resourcing requirement. The final proposals will face scrutiny by the Treasury and need to match the standard of evidence in its [‘Green Book’](#).

Timeline (current pre-election government)

13. The government’s Town Deal prospectus sets out the initial timelines for agreeing Town Deals:

- Capacity funding distributed to Lead Councils in November 2019
- Readiness checklist completed by 19th December 2019
- All towns to have established and held the first Town Deal Board meeting by end of January 2020
- All towns to have completed Town Investment Plans by end of summer 2020.

14. The timelines are subject to further guidance being published in January 2020.

Town Deal Board

15. The government's prospectus strongly suggests that a Town Deal Board be established using key existing partnerships that may already be present in the town.
16. The Town Deal Board will be the vehicle through which the vision and strategy for the town is defined. It will produce a Town Investment Plan and inform the Town Deal, including the amount of investment secured through the Towns Fund.
17. Its key tasks will be as follows:
 - A. Develop and agree an evidenced based Town Investment Plan
 - B. Develop a clear programme of interventions
 - C. Coordinate resources and influence stakeholders.
18. The Town Deal Board will serve as an advisory function to Hastings Borough Council as the lead authority and programme management for the Town Fund and Deal. However, it will be a body of real significance locally, regionally and with government and critical to the development of a programme with wider buy in.
19. It is suggested that the Board be established by utilising the capacity and roles of existing partnership structures such as the Hastings Local Strategic Partnership, Hastings and Rother Task Force, Hastings Opportunity Area, and other related partnerships. It is critical not to produce another initiative focused board, but work with partners in a strategic and resource efficient way. Given the timescales set by the government, the work to establish the board has been commenced.

Lead Authorities Roles

20. HBC is expected to be the lead authority and take the management role for the Town Fund. This includes taking responsibility for procuring, managing and maintaining all the support services until the Investment Plan is agreed and business plan produced. Responsibility for programme delivery will be identified in the final Town Deal agreement and its implementation plans. More guidance is expected from the government regarding delivery structures.
21. A deal developed in co-operation with East Sussex County Council is essential as the tier of Local Government leading on transport, education, digital skills, and public health. Early discussion at officer level has been very positive.
22. Close co-operation with other partners including the Local Enterprise Partnerships will be required to ensure the Town Fund augments draws down other funding, which places a sharp focus on joined up working at all levels in order to maximise the value and impact of the programme to Hastings.

Timetable of Next Steps

23. Please include a list of key actions and the scheduled dates for these:

Action	Key milestone	Due date (provisional)	Responsible
Preparing the 'readiness check list'	Submission of the checklist to central government	19 th December 2019	Victoria Conheady – Assistant Director
Town Deal Board	Consulting on the board with partners Agreeing the Terms of Reference and establishing the Board	December 2019 / January 2020 31 st January 2020	Victoria Conheady – Assistant Director
Town Investment Plan	Publication of the Investment Plan and the draft proposal for the Town Deal	Summer 2020	Town Board Supported by - Pranesh Datta, Economic Development Manager
Town Deal	Negotiation and agreement of the Town Deal proposal with the government	2020/2021	Simon Hubbard, Director of Operational Services

Wards Affected

All

Implications

Please identify if this report contains any implications for the following:

Equalities and Community Cohesiveness

The Town Deal should directly address issues of social mobility, skills and access to local jobs in maximising its impact. If other funding streams are also brought into play, it will also address wider health and wellbeing issues.

Risk Management

As part of the project, management process a governance structure including a risk log and assessment will be developed and maintained from the outset.

The initial risks relate to the establishment of a cohesive board and procuring the level of special expertise and leadership to support the development of the Investment Plan and the Town Deal. The government has not yet fully published all its guidance and until this is available, a full assessment of any potential risks is not possible.

Economic/Financial Implications

This fund has the potential to lever investment of up to £25m of government funds as well as further public and private investment. The development of the bid should carry no financial implications and the deal itself will need to address the cost of the council resourcing this programme.

Human Rights Act

n/a

Organisational Consequences

Officer resources will be required to deliver and manage the Town Deal work, as detailed above. Arrangements will be made for both the development phase and then for the longer term programme. The council will seek to fund additional cost pressures from the fund itself where this is legitimate.

Local People's Views

The guidance clearly identifies the need for community engagement, as well as involvement of current structures. The Town Board will need to identify the consultation and communication strategies to ensure public awareness and engagement is maximised.

In the meantime, officers have produced a communications plan from mid-December until end of January, which will be updated and continue to be a living document as further guidance is released by government.

The communication plan currently includes:

- Production of a Town Deal webpage and Frequently Asked Questions which will sit in the Regeneration area of the website, along with a homepage banner. This will go live on 20 December in line with the publication of the Cabinet papers.
- Issuing of a press release, in line with publication of cabinet papers, informing the public about the Town Deal fund and the Council's intention (subject to Cabinet approval) to develop a town deal bid and set up a board as per the prospectus guidance
- Councillors briefing informing them about the fund and the key messages
- Setting up and holding a Town Deal board meeting by the end of January 2020, publish board structure and governance documents on the council's website.

Anti-Poverty

The Board will need to consider how the needs of the most excluded can be built into the thinking of the draft Deal.

Climate Change

The Town Investment plan will be informed by our developing climate change strategy. This includes consideration of potential investment options in renewables, development and encouragement of low carbon buildings and transport infrastructure assets.

Additional Information

The attached link provides further information to the Town Fund prospectus:

<https://www.gov.uk/government/publications/towns-fund-prospectus>

Officer to Contact

Pranesh Datta

Email address: PDatta@hastings.gov.uk

Tel: 01424 451784

Mobile: 07973 389594

This page is intentionally left blank

Agenda Item 7



Report to: Cabinet

Date of Meeting: 6th January 2020

Report Title: Buckhole Reservoir

Report By: Mike Hepworth
Assistant Director Environment and Place

Purpose of Report

For cabinet to consider and agree the following:-

- The most appropriate scheme of works to improve the operation of the reservoir in accordance with the relevant statutory requirements.
- The way the project will be managed and delivered, including the appointment of specialist contractors to support the project throughout the design and construction phases.
- The budget for the project.

Recommendation(s)

1. Cabinet agrees that the 2 options recommended by Stillwater Associates Ltd in the reports attached at appendices 1 and 2 are the most appropriate way for the council to meet the requirements of the Reservoirs Act 1975.
2. Cabinet authorises the Director of Operational Services to work with the East Sussex Procurement Hub, to procure and let a contract to deliver the two options recommended in the reports attached at appendices 1 and 2.
3. Cabinet authorises the Director of Operational Services to contract with Stillwater Associates Ltd to provide the main specialist technical support to the council throughout the project, including that referred to in paragraph 18. As well as contracting with any other specialist contractors that may be required.
4. Cabinet increases the capital programme budget for Buckhole Reservoir from £71,000 to £837,000 and agrees the revenue implications of an additional £62,775 p.a. as detailed in paragraphs 33 to 36.

Reasons for Recommendations

The works to the reservoir are a mandatory requirement enforced by the Environment Agency, and the council needs to approve a scheme of works to secure compliance with the current statutory guidance.

A specialist approved reservoirs contractor has provided the council with comprehensive reports evaluating the options and recommending those, which they believe, are the most appropriate.

Following discussions between the council's specialist reservoirs inspection contractor and the Environment Agency, the deadline for completing the works is provisionally April 2022.

Introduction

1. Under the Reservoirs Act 1975, the council has a legal obligation to undertake annual and ten yearly inspections of qualifying reservoirs. Buckshore and Shornden Reservoirs in Alexandra Park are of sufficient size and capacity to require these inspections. It should be noted that neither reservoir is now used for the storage of drinking water. They are essentially part of the flood protection system for the town, and used for amenity purposes such as fishing.
2. The council arranges for the statutory inspections to be carried out by Stillwater Associates Ltd, using qualified approved reservoir engineers.
3. The annual inspections generally only identify relatively minor maintenance works that can often be funded from existing approved budgets. However, the ten-year inspections have the potential to identify significant improvements, which cannot be funded from within existing budgets.
4. The national standards enforced through the Reservoirs Act are periodically reviewed and updated to reflect current thinking on what is reasonably practicable, and the latest flood risk data. We should bear in mind that Buckshore reservoir was built in 1852, and reservoir design and maintenance standards have changed since then. In addition, climate change is causing more extreme weather events leading to a higher likelihood of flooding, and the potential for reservoir dams to overtop. Such as occurred recently at the Toddbrook Dam in the Midlands.
5. The enforcement agency for all relevant UK reservoirs is the Environment Agency (EA). The EA has categorised both reservoirs as 'high risk' due to their capacity and location. They require all works identified in the inspection reports to be undertaken as directed under Section 10 of the Reservoirs Act 1975.
6. The most recent ten-year inspections were undertaken in 2016 and we received both inspection reports in April 2017. The works required to Shornden Reservoir were relatively small scale and were completed earlier this year. However, the works required to Buckshore reservoir are far more extensive and costly, and require separate consideration and approval.
7. All completed mandatory works require a Completion Certificate from an engineer appointed under Section 10(6) of the Act. Completion Certificates are lodged with the EA.

Works required to Buckshore Reservoir

8. The council's specialist reservoirs inspection contractor, Stillwater Associates Ltd, has produced the following 2 options reports relating to Buckshore reservoir:-
 - Buckshore Reservoir Spillway Channel ALARP Study – October 2019 – attached as appendix 1.
 - Buckshore Reservoir Report on Options for New Emergency Drawdown Facility – September 2018 – attached as appendix 2.

9. The reports consider options for improving the performance of different elements of the reservoir under extreme weather conditions, and make recommendations as to the most appropriate options to implement. The council needs to implement one option from each report and the estimated cost of each of the recommended options is set out in appendices 1A and 2A, and totals £800k (exclusive of VAT). However, Stillwater Associates Ltd estimate that if both recommended options are carried out at the same time by the same main contractor, there could be a saving of about £50k. Carrying out all the works at the same time would also be less disruptive overall in terms of construction activities and loss of amenity for the public.
10. As a result of these 2 comprehensive reports, cabinet can consider and agree the preferred options, how works should be procured, and how the project should be managed.
11. The senior management commentary within this report assumes that cabinet will have read and considered the options set out in the two reports at appendices 1 and 2. However, the following sections of the report draw attention to the most salient factors and offer some explanation of them.

Consideration of the Spillway Improvement Options in the ALARP Report (appendix 1)

12. It is suggested that the key consideration within this options report is the concept of 'reasonably practicable', which underpins the ALARP approach. ALARP being 'as low as reasonably practicable'. As stated in the executive summary:

"The ALARP approach is an industry accepted risk based approach aimed at reducing risk to the public and property downstream to 'as low as reasonably practicable'. It follows a rigorous and logical methodology with the aim of identifying options for improvement works that would reduce the risk of failure of a dam to an acceptable level at a cost that is proportionate to the reduction in risk achieved. Guidance on how to decide whether works are proportionate is given in the Guide to Risk Assessment for Reservoir Safety Management (Environment Agency, 2013) whilst guidance on the tolerability of risk to life is provided by the Health and Safety Executive."
13. '**Reasonably practicable**' is a concept that is commonly applied in areas of statutory compliance involving public safety. Including some that are enforced by the council in relation to commercial business premises and their activities. For example in relation to environmental pollution control, and also health and safety at work enforcement. It recognises that it would be unreasonable to expect a 'statutory duty holder' to implement every **possible** measure to mitigate against the risk of a hazard affecting a person in the vicinity. As this would result in a disproportionate and unfair financial burden on them, because affordability is an important consideration when determining what is 'reasonably practicable'.
14. This is why Stillwater Associates Ltd does not recommend option 2, and instead recommend the council implements option 3. Option 3 also offers the lowest 'cost' in terms of other important considerations. These being future maintenance and impact in terms of landscape and ecology. There is also scope within option 3 to carry out physical hydraulic modelling that could result in design improvements that

would further reduce the risk of dam failure, bringing it closer still to satisfying the basic standards based approach.

Consideration of the Emergency Drawdown Options (appendix 2)

15. A safe means of drawing down the reservoir (significantly reducing the water level), is a vital aspect of a plan to make the reservoir safe in the event of an emergency. For instance during extreme flood events, or should there be a problem identified with the dam or spillway.
16. The need to improve the drawdown facilities at the dam was identified in the last ten yearly statutory inspection. The existing drawdown facility within the draw-off tower is no longer deemed acceptable because it would not be readily and safely accessible in adverse weather conditions. Access to the tower requires a boat and scaling ladder from the boat. As a result the requirement is for a fully accessible system independent of the existing draw-off tower.
17. Stillwater Associates Ltd has given comprehensive expert consideration to the various options. There have been several technical reports culminating in the one attached as appendix 2. In it Stillwater Associates Ltd recommend the council implements option 1, which will comply fully with the statutory guidance, be relatively straight forward from a construction perspective, and low maintenance in the future.

Project Management of the Scheme

18. A high value and complex project such as this must be subject to the council's project management approach. A project team has been assembled with representation from all relevant service areas, and discussions held with the East Sussex Procurement Hub, which is hosted by Wealden District Council. Although the hub will facilitate the procurement elements of the project, neither they or the council have any staff/management with the technical competencies needed to carry out the following essential work:-
 1. Refinement and amalgamation of the 2 schemes of work into a single project to enable the projected cost savings of about £50k.
 2. Production of the final designs and contract specifications and requirements for the 2 chosen options, sufficient for the council to put this work out to tender.
 3. Assistance with the procurement of the main construction contractor. For example support with the tender evaluation process.
 4. Arranging for and carrying out all pre-construction elements of the project such as planning design, trial pits/topographical work, environmental surveys/consents, submission of any planning applications, and refinement of designs once planning approval and other consents are in place.
 5. Oversight and operational supervision of the main contractor throughout the construction works.
 6. Signoff of works on satisfactory completion.

19. The project team will therefore need the support of a specialist reservoirs contractor such as Stillwater Associates Ltd throughout the procurement, pre-construction, and construction phases of the project.
20. Stillwater Associates Ltd carried out the statutory inspections that identified the need for these mandatory improvements. Since then they have provided all the technical advice on the proposed reservoir improvements including the two options reports attached as appendices 1 and 2. It therefore seems reasonable to consider retaining them to deliver the works outlined above in paragraph 18. Rather than seeking tenders from alternative specialist contractors to support the project.
21. Over the last few years, they have accumulated a great deal of valuable in depth technical knowledge about the reservoir, which will be extremely beneficial to the future success of the project. In addition, they provided the specialist support required during the improvements to the Shornden Reservoir, which were successfully completed earlier this year.
22. In the circumstances, it would be difficult for a different specialist contractor to provide the same quality of project support for the Buckshole Reservoir project, and at the pace it will be required if the project is to secure compliance with these mandatory works within the timeframe required.
23. There is also a risk that a different specialist contractor would make errors because they hadn't been involved in the work associated with the options reports produced by Stillwater Associates Ltd.
24. The Assistant Director for Environment and Place has discussed the provision of this essential specialist project support with the Chief Legal Officer and the Assistant Director Financial Services and Revenues. They agree that for the reasons described above, it is appropriate to ask cabinet for an exemption from the council's financial rules on procuring contractors so that Stillwater Associates Ltd can be appointed in this role.

Risk Management

25. Although there is a relatively low likelihood of the dam overtopping now or in the future, if it did overtop and the existing spillway failed, there would be a high impact on the local community and environment. With the potential for loss of life and property damage. It is therefore essential that these works be approved, so that the council's ability to manage an incident requiring the level of the reservoir to be lowered can be significantly improved.
26. If the council ignored the requirements of the statutory reservoir inspection reports and didn't carry out the recommended works, the following risks are amongst those that could develop:-
 - The Environment Agency could instigate enforcement action against the council.
 - The dam could fail during an extreme weather event leading to loss of life and/or damage to property.

27. In both cases, there would be serious damage to the reputation of the council, and also serious legal and financial implications.
28. Retaining Stillwater Associates Ltd to provide specialist support throughout the procurement and construction phases of the project, will ensure consistency of specialist professional advice, and reduce the likelihood of problems arising due to a lack of clarity on the concepts and rationale behind these 2 schemes of work.
29. Despite the comments above, it is worth reiterating that the chances of a serious incident developing at the Buckshole Reservoir are relatively low, and the onset would most likely be slow, rather than a rapid onset. Thereby allowing the temporary evacuation of those thought to be at most risk. In addition, if there was an incident the council would expect to work with other authorities to try to reduce the level of the reservoir as safely as possible using the existing infrastructure, and possibly also portable pumping systems, as was seen at the Toddbrook Reservoir in August 2019.
30. Once the works have been completed the options report estimates that the probability of the spillway failing will be in the order of 1 in 116,000 per annum, and by implementing the recommended option there will be a low likelihood of further upgrade works being required.

Environmental Issues and Climate Change Implications

31. As set out in the options reports, there will be some environmental issues arising from the construction works proposed. However, the recommended options are relatively less harmful to the environment, and if the dam was to overtop or the spillway to fail, there would be very serious environmental consequences. Also by carrying out both schemes of work at the same time using the same main contractor there will be less impact on the environment and local amenity. For example fewer vehicle/plant and equipment movements.
32. To some extent, the works proposed in this report actually arise as a result of climate change. The reservoir safety standards have been reviewed and updated to reflect an increased likelihood of extreme weather events that could result in flooding.

Economic/Financial Implications

33. The options reports attached at appendices 1 and 2 include estimates of the cost of carrying out each of the two recommended improvement schemes. For ease of reference, these cost estimate sheets are set out separately in appendices 1A and 2A and total £800k (exclusive of VAT). However, it is estimated that there should be a saving of about £50k if both schemes are carried out at the same time by the same main contractor. Based on these cost estimates but subject to procurement, the basic capital cost of the contracted works may be in the region of £750k. However, the construction element needs adjusting to take account of inflation as the main construction works will not take place until Spring/Summer 2021, and a 10% contingency should be included.
34. In addition to this, there will also be minor works associated with the project that may be delivered direct by the council rather than the main construction contractor.

Such as the installation of public protection from the increased drop of the new wider and deeper spillway, and public awareness signage. Subject to the procurement of these works, a provisional sum of £11k is suggested.

35. The capital programme currently includes £71k for works/studies to Buckshole reservoir of which some £18k has been spent to date. It is recommended that this budget is increased to £837k and is included within the council's capital programme.
36. The revenue implications of borrowing this sum amount to £62,775 p.a. (£837,000, financed over 25 years, at 3.5% - PWLB Maturity loan). This represents growth in the budget.
37. Given that the requirement to undertake these works stem from the government increasing safety requirements it can be argued that this is an additional burden on the Council and as such should be funded by the government (in line with the promise to fund new burdens). To this end, it is proposed that the Council writes to the Department for Environment, Food and Rural Affairs (Defra) for grant funding (the works not being delayed by the application for grant funding).

Wards Affected

Parts of Silverhill, St Helens, Baird, Braybrook, Gensing and Castle.

Implications

Please identify if this report contains any implications for the following:

Equalities and Community Cohesiveness	No
Crime and Fear of Crime (Section 17)	No
Risk Management	Yes
Environmental Issues	Yes
Economic/Financial Implications	Yes
Human Rights Act	No
Organisational Consequences	No
Local People's Views	No
Anti-Poverty	No

Additional Information

- Appendix 1 – Buckshole Reservoir Spillway Channel ALARP Study – October 2019
- Appendix 1A – Spillway ALARP Recommended Option Costings
- Appendix 2 – Buckshole Reservoir Report on Options for New Emergency Drawdown Facility – September 2018
- Appendix 2A – Emergency Drawdown Recommended Option Costings

Officer to Contact

Mike Hepworth – Assistant Director Environment and Place

Report Template v29.0

mhepworth@hastings.gov.uk
01424 783332

This page is intentionally left blank



Buckhole Reservoir

Spillway Channel ALARP Study

Assessment of whether the risk of failure of the dam due to spillway channel failure and subsequent erosion of the embankment material during flood events is “as low as reasonably practicable” (ALARP)



October 2019

Executive Summary

Buckhole Reservoir is located on the northern side of Alexandra Park in the heart of Hastings, East Sussex. The reservoir is owned and operated by Hastings Borough Council. The lake provides a public amenity as part of the Grade II listed Alexandra Park and is used for fishing.

A report on the reservoir was issued in 2017 following a statutory inspection under section 10 of the Reservoirs Act 1975. The report included the following mandatory recommendations:

- a) *Obtain dambreak maps and [the downstream flood risk] consequence assessment from the Environment Agency when they have been updated to 2016 “reservoir flood map specification”, to quantify the incremental consequences if the dam failed in a major flood;*
- b) *The output from the above should then be considered by a Panel AR Engineer [All Reservoirs Panel Engineer], and if appropriate an ALARP study undertaken of measures to increase spillway chute capacity, followed by implementation of measures which are proportionate in cost relative to the reduction in risk achieved.*

The information required to satisfy recommendation (a) was obtained earlier in 2019.

An ALARP (As Low As Reasonably Practicable) study has now been completed by Stillwater Associates for the purpose of item (b), and forms the basis of this report.

The ALARP approach is an industry accepted risk based approach aimed at reducing risk to the public and property downstream to ‘as low as reasonably practicable’. It follows a rigorous and logical methodology with the aim of identifying options for improvement works that would reduce the risk of failure of a dam to an acceptable level at a cost that is proportionate to the reduction in risk achieved. Guidance on how to decide whether works are proportionate is given in the Guide to Risk Assessment for Reservoir Safety Management (Environment Agency, 2013) whilst guidance on the tolerability of risk to life is provided by the Health & Safety Executive.

The study involved consideration of the following important factors that ultimately informed the outcome of the ALARP process:

Annual probability of failure of the dam

A thorough and industry recognised approach has been followed to assess the risk of the dam failure. The assessment has used contemporary data from a documented incident at Ulley Reservoir in 2007. This resulted in an annual probability of failure of Buckhole Reservoir in the order of 2.6×10^{-3} (~1 in 400 chance).

Consequences of a dam break to the public and properties downstream

An updated dam break analysis has carried out. This analysis has yielded more robust data than that available from the Environment Agency. The assessed consequences are that dam failure would result in certain loss of life and property damage estimated at around £11M.

Tolerability of the risk imposed by the dam on the public and properties downstream

Based on Health and Safety Executive guidance the assessment has shown that the current risk to the public and property downstream due to the presence of Buckhole Reservoir is within the ALARP zone.

In accordance with the adopted risk-based (ALARP) approach, the Council must consider carrying out works in the form of improvements to the spillway channel chute to improve the safety of the reservoir, to reduce the risk of dam failure to as low as reasonably practicable.

The purpose of this report is to draw together the findings of the assessments at a high level, presenting options that will reduce the risk to an acceptable level, to enable Hastings Borough Council to decide on the most appropriate way forward.

The results of the ALARP assessment of viable and proportionate options are summarised in the following table.

Consideration	Option 2	Option 3	Option 4	Option 7
Option description	Large capacity concrete channel with covers to contain flows following existing channel footprint	Large capacity open concrete spillway channel following existing channel footprint	Large capacity open concrete spillway channel with new straight alignment	Open concrete channel replacing original trapezoidal channel with concrete block bank erosion protection.
Outcome of Risk Based Approach (ALARP)	Option shown to be proportionate, satisfying risk based approach	Option shown to be proportionate, satisfying risk based approach	Option shown to be proportionate, satisfying risk based approach	Option shown to be proportionate, satisfying risk based approach
Relative Probability of Failure Following Works	Low Probability of failure ~ 2.5×10^{-6} [1 in 400,000 annual chance]	Medium Probability of failure ~ 8.6×10^{-6} [1 in 116,000 annual chance]	Medium Probability of failure ~ 5.1×10^{-6} [1 in 194,000 annual chance]	High Probability of failure ~ 6.2×10^{-5} [1 in 16,000 annual chance]
Performance Against Reservoir Safety Standards (Standards Based Approach)	Fully complies with reservoir safety standards The covered channel provides full capacity up to the PMF event	Delivers sufficient reservoir safety improvement, with defendable justification for not fully complying with reservoir safety standards Flows expected to overtop channel side walls in the most extreme floods due to turbulent flow around the initial 90° bend and curved sections of channel	Delivers sufficient reservoir safety improvement, with defendable justification for not fully complying with reservoir safety standards Flows expected to overtop channel side walls in the most extreme floods due to turbulent flow around the initial 90° bend	Marginally delivers sufficient reservoir safety improvement. May not be defendable for not complying with reservoir safety standards. Flow expected to overtop the channel sidewalls in floods greater than 1 in 500 year event, with concrete block protection on the downstream face
Landscape and Visual Impact	Low Some loss of trees. Channel could be covered with grass	Medium Some loss of trees and large open concrete channel visible, but less intrusive than Option 4	High Greater loss of trees than Option 3. Large open concrete channel visible, with higher right retaining wall than Option 3	High Extensive tree loss and adverse visual impact of visible concrete blocks
Indicative Ecology Impact	Medium	Medium	Medium	High
Public Safety	Low Chute would be covered; downstream security grille could be added	Medium Open channel chute would be accessible to the public	Medium Open channel chute would be accessible to the public	Medium Open channel chute would be accessible to the public
Maintenance	High Confined spaces entry required	Medium	Medium	Medium
Planning & Consents	Planning permission will be required; further ecology desk top assessments and/or surveys may be required, to be defined and carried out in consultation with the relevant statutory consultees; Alexandra Park is a Grade II listed park, and as such consent will be required from Historic England.			
Future Proofing	Low and Least Risk Satisfies current standards (standards based approach) and unlikely to require further upgrade works in the future	Low Risk Provides a significant reduction of risk at a proportionate cost: low likelihood of further upgrade works being required	Low Risk Provides a significant reduction of risk at a proportionate cost: low likelihood of further upgrade works being required	High Risk Only marginally satisfies the risk-based approach: significant risk of further upgrades required in the future
Estimated Project Cost [Indicative Maintenance Cost]	£900k [Medium maintenance cost due to safety requirements]	£650k [Low maintenance cost]	£750k [Low maintenance cost]	£500k [Low maintenance cost]

To reduce the risk of failure of the dam to as low as “reasonably practicable” involves selection of the option that firstly satisfies the risk based approach, and secondly complies with the reservoir safety standards (standards based approach) where possible. If not possible, the option should provide defendable justification, with compelling evidence, that it is not “reasonably practicable” to fully comply with reservoir safety standards. It is noted that the finalised option layout must be approved by an All Reservoirs Panel Engineer (ARPE) who should oversee the design and construction in the role of Qualified Civil Engineer (QCE). Completion of the approved design, under the supervision of the QCE, would then allow the Section 10(6) Certificate under the Reservoirs Act 1975 to be issued.

Recommended Option

It is recommended that Option 3 is adopted. This option delivers a significant improvement in terms of reservoir safety, and whilst not fully satisfying the standards based approach, the option does reduce the probability of dam failure to an acceptable level (risk-based approach) and at a reasonable cost making it 'reasonably practicable' to implement. In addition, this option is anticipated to have a relatively low adverse impact in terms of landscape and ecology. Option 3 could be designed with features that reduce the current public safety risks associated with the existing spillway and offers the lowest cost in terms of future maintenance.

In view of the complexities of the hydraulic operation associated with the proposed channel for Option 3 it is strongly recommended that a physical hydraulic model is developed to optimise the detailed design. This should allow targeted improvements to be made in the performance of the channel, for instance by using carefully positioned flow training walls, which would further reduce the risk of damage to the dam during extreme flood events, thus further reducing the risk of dam failure, bringing it closer still to satisfying the standards based approach for the Category A reservoir.

The estimated out-turn cost for Option 3 is £650,000 (exc. VAT).

It must be recognised that the options appraisal process, under the risk based approach used, has demonstrated that **Option 2** (a covered channel) is both proportionate in terms of cost / risk reduction and fully satisfies reservoir safety standards for a Category A reservoir. In other words, in terms of satisfying both the standards and risk based approaches, this would be the preferred option for Buckshole Reservoir. However, it is also recognised that affordability is an important consideration when determining what is 'reasonably practicable'.

Option 4 provides marginally greater risk reduction compared to Option 3, but at greater cost, and with notably greater visual and landscape impacts. Further, physical modelling at design stage should yield improvements in flow characteristics, bringing Option 3 more in line with the hydraulic performance offered by the Option 4 straight downstream channel. The cost of modelling is included in the Option 3 costing.

Whilst **Option 7** appears to offer the least cost solution that still satisfies the risk based approach this option is likely to raise significant objections in terms of adverse landscape and ecology impacts. This may make it difficult to promote through the planning process. Since this option also only marginally satisfies the risk based approach the Council would also need to be prepared to carry out further improvement works to the reservoir should guidance, and / or downstream conditions, change in the future.

The construction of the new spillway channel for Option 3 can be implemented in conjunction with the installation of a new siphon draw-down system, the subject of a study carried out in 2018. Completing these works fully addresses the 2017 safety recommendations.

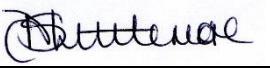
The total combined out-turn cost for constructing the new spillway channel (Option 3 from the current study) and the installing the new siphon draw-down facility (Option 1 from the 2018 study) is estimated as £750,000 (exc. VAT). This includes all planning, design and implementation costs. It does not include Hastings Borough Council internal costs.

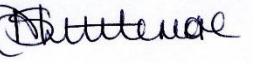
The deadline for completing the works in accordance with the mandatory recommendations is April 2022. Assuming there are no significant landscape or ecology issues it should be possible to obtain consents by the end of 2020. This would allow enabling works, in the form of tree felling and vegetation removal to be completed early in 2021, with the main works implemented during spring/summer 2021 to satisfy the statutory deadline.

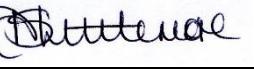
The following is suggested as an indication of the phasing of costs for Draw-down Option 1 (2018 study) and Spillway Channel Option 3:

Year 1 [FY 2019/20]	Year 2 [FY 2020/21]	Year 3 [FY 2021/22]
Internal approvals and planning	Surveys, investigations, physical modelling, design and tender	Construction
£50k	£150k	£550k

Client:	Hastings Borough Council
Project:	Buckhole Reservoir
Document Title:	Spillway Channel ALARP Study [Assessment of whether the risk of failure of the dam due to spillway channel failure and subsequent erosion of the embankment material during flood events is "as low as reasonably practicable" (ALARP)]
Project No:	SE108

ORIGINAL	Originator	Checked by	Reviewed by
DRAFT	HT Stehle / JP Holland	TR Wanner	DS Littlemore
Signature:			
Issue Date:	27 th September 2019		
Document Status	Issue for client review		

REVISION	Originator	Checked by	Reviewed by
FINAL	HT Stehle / JP Holland	TR Wanner	DS Littlemore
Signature:			
Issue Date:	9 th October 2019		
Document Status	Final Issue following client review		

REVISION	Originator	Checked by	Reviewed by
FINAL v2	HT Stehle / JP Holland	TR Wanner	DS Littlemore
Signature:			
Issue Date:	15 th November 2019		
Document Status	Updated Final Document with further clarifications		

REVISION	Originator	Checked by	Reviewed by
Signature:			
Issue Date:			
Document Status			

Contents

Executive Summary	i
1 Scope	1
1.1 General	1
2 Background	2
2.1 Available Information	2
2.2 Location	2
2.3 Description of the Reservoir	2
2.4 Description of the Valley Downstream of the Reservoir	3
2.5 Reservoir Flood Assessment	3
2.6 Existing Siphon Spillway and Downstream Chute	4
2.7 ALARP Assessment	9
3 Existing Arrangements – Probability of Failure	10
3.1 Introduction	10
3.2 Screening of Possible Failure Modes	10
3.3 Existing Probability of Failure	10
4 Downstream Consequences of a Dam Breach	17
4.1 General	17
4.2 National Reservoir Flood Mapping (RFM, 2009)	17
4.3 Updated National Reservoir Flood Mapping (RFM, 2016)	19
4.4 Impact of Dam Failure on People	19
4.5 Updated Dam Break Analysis and Consequence Assessment	20
4.6 Tolerability of Existing Risk to Downstream Property and Communities	23
5 Options for Spillway Channel Improvements	26
5.1 General	26
5.2 Long List of Options	26
5.3 Short List of Options	29
5.4 Short List Option 2	29
5.5 Short List Option 3	31
5.6 Short List Option 4	33
5.7 Short List Option 7	34
5.8 Short-listed Options: Reduction in Probability of Dam Failure	36
6 ALARP Assessment	40
6.1 Introduction	40
6.2 ALARP Results	40
6.3 Sensitivity	41
6.4 Other Considerations	41

7	Scheme Implementation and Delivery Programme	43
7.1	Recommendations and Statutory Deadlines	43
7.2	Implementation Approach and Timing of Works	43
7.3	Programme	44
8	Conclusions & Recommendations	45
8.1	General	45
8.2	Findings of ALARP Study	45
8.3	Recommendations	48
9	References	49
Appendix A	Outline Scope & Available Information	50
Appendix B	ALARP Criteria	52
Appendix C	EA Reservoir Flood Maps (2016)	54
Appendix D	Event Tree Analysis for the Existing Spillway Channel	55
Appendix E	Summary Note on Ulley Reservoir Incident	56
Appendix F	Layout Sketches for Short-listed Options	57
Appendix G	Cost Estimates for Short-listed Options	58
Appendix H	Event Tree Analysis for Short-listed Options	59
Appendix I	CC Hydrodynamics Risk Curves	60

List of Figures

Figure 2.1: Location of Buckhole Reservoir	2
Figure 2.2: General layout of the spillway at Buckhole Reservoir	5
Figure 2.3: Long and cross-sections of the 1985 siphon spillway and downstream chute	6
Figure 2.4: Rating curve for the siphon spillway at Buckhole Reservoir	7
Figure 3.1: Visual presentation of the sequence of events that would lead to failure	11
Figure 3.2: The event tree that lists out the logical steps that would lead to failure	11
Figure 3.3: Fragility curve produced for the masonry channel at Buckhole Reservoir	13
Figure 3.4: Relationship of the slope safety factor to annual probability of failure (Figure 8.4 in RARS 2013)	15
Figure 4.1: Flood inundation mapping due to reservoir failure (RFM, 2009)	18
Figure 4.2: Excerpt from the EA Reservoir Flood Map for a wet day failure (RFM, 2016)	19
Figure 4.3: The dam break risk curve for population at risk	22
Figure 4.4: The dam break risk curve for average societal loss of life	22
Figure 4.5: The risk curve for anticipated building damages	23
Figure 4.6: F-N chart showing tolerability of societal risk of a dam failure during floods at Buckhole Reservoir	25
Figure 5.1: Option 2 Proposed New Covered Channel	30
Figure 5.2: Indicative areas of vegetation loss related to an enlarged channel	31
Figure 5.3: Option 3 Proposed New Spillway Channel (no covers)	32
Figure 5.4: Option 4 Proposed New Spillway Channel (straight alignment – no covers)	33
Figure 5.5: Option 7 Proposed New Spillway Channel and Concrete Block Protection to Dam 35	35
Figure 5.4: The event tree template that lists out the logical steps that would lead to failure for each of the short-listed options	36
Figure 5.5: Fragility curve produced for good grass protection on the downstream face	37
Figure 5.6: Fragility curve produced for interlocking concrete blocks on the downstream face	38
Figure 5.7: F-N chart showing the risk reduction achieved by each of the short-listed options	39

List of Tables

Table 2.1: Key dimensions relating to the reservoir	3
Table 2.2: Features downstream of dam (adapted from 2017 S10 Report)	3
Table 2.3: Summary of previous estimates of peak inflows	4
Table 3.1: Recommended standards for flood safety at category A dam (ICE, 2015)	10
Table 3.2: Possible failure modes associated with floods	10
Table 3.3: Event likelihood and associated estimated factors [adapted from Mason (2010)]	12
Table 3.4: Typical erodibility coefficients (Hanson et al, 2001)	14
Table 3.5: Summary of the calculated values for each flood event that were used during the determination of the annual probability of failure	15
Table 3.6: Summary of the annual probabilities of failure that were calculated during the event tree analysis	16
Table 4.1: Results of the consequence assessment stemming from the updated RFM (2016)	20
Table 4.2: The results obtained for a dam break during the PMF event	20
Table 4.3: The results obtained for a dam break during the 1,000-year flood event	20
Table 4.4: Local maximum downstream consequence numbers determined by considering a range of different dam break events (EA RFM results included for comparison)	21
Table 4.5: Criteria for tolerability of risk to human life in the UK as suggested in R2P2 (RARS, 2013)	23
Table 4.6: Risk outputs related to individual vulnerability due to a dam break during floods	24
Table 4.7: Risk outputs related to societal life loss due to a dam break during floods	24
Table 5.1: Summary of long-listed options	27
Table 5.2: Summary of the annual probability of failure that was calculated for each of the short-listed options	38
Table 6.1: Summary of costs and benefits for the short-listed options	40

1 Scope

1.1 General

Buckhole Reservoir is located in Hastings and the current owner is Hastings Borough Council. The latest Section 10 Inspection Report (dated 7th April 2017) by Alan Brown categorised the dam as **Flood Category A**. The following mandatory recommendations "in the interest of safety" were made in the S10 Inspection Report:

- a) *Obtain dambreak maps and consequence assessment from the Environment Agency when they have been updated to 2016 "reservoir flood map specification", to quantify the incremental consequences if the dam failed in a major flood;*
- b) *The output from the above should then be considered by a Panel AR Engineer, and if appropriate an ALARP study undertaken of measures to increase spillway chute capacity, followed by implementation of measures which are proportionate in cost relative to the reduction in risk achieved.*

A partial Section 10(6) Certificate was issued on 4th September 2019 to certify that item (a) had been completed. This report provides the details of the ALARP study that was carried out by Stillwater Associates for the purpose of assisting Hastings Borough Council to satisfy item (b).

It was agreed that the scope of works carried out by Stillwater Associates would include the following tasks. These tasks are listed in more detail in **Appendix A**:

Task 1 – Determine the incremental consequences of a dam breach during fluvial flooding.

Task 2 – Assessment of the annual probability of damage and failure of the dam (release of the reservoir) due to spillway channel failure and subsequent erosion of the embankment material.

Task 3 – Develop possible options to upgrade the spillway channel and determine probabilities of reservoir failure in each case.

Task 4 – ALARP assessment (project costs, benefit-cost ratio).

2 Background

2.1 Available Information

Information available to Stillwater Associates is summarised in **Appendix A**.

2.2 Location

Buckhole Reservoir is located in Alexandra Park in the heart of Hastings, East Sussex (as shown in Figure 2.1 below). The Ordnance Survey Grid Reference of the dam retaining the lake is TQ 806 109 (nearest postcode is TN34 2EH).

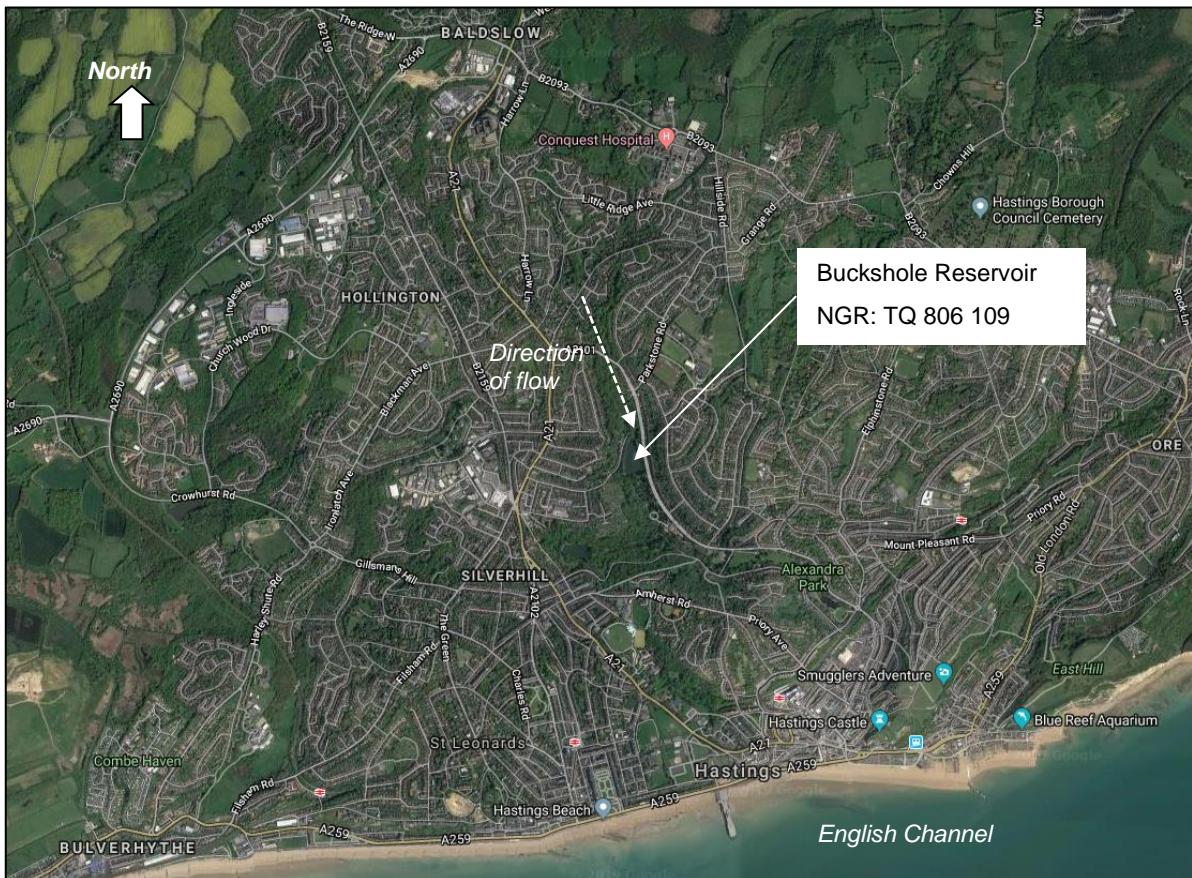


Figure 2.1: Location of Buckhole Reservoir

2.3 Description of the Reservoir

Buckhole Reservoir was built in 1852 to serve as a water supply for Hastings. The lake is now only used for fishing and provides a public amenity as part of an important Grade 2 listed public park in the heart of Hastings. The current owner is the Hastings Borough Council.

The dam comprises an earth embankment with a concrete siphon spillway structure located on the right bank which discharges into a concrete spillway channel running down the right mitre of the dam.

There is a left bank bypass culvert which is believed to have originally comprised a brick channel which ran to the east of the reservoir in order to divert stream flows around the reservoir. This structure had been modified several times in the years gone by and the facility is no longer in use.

The key dimensions relating to the reservoir are summarised in Table 2.1 below.

Table 2.1: Key dimensions relating to the reservoir

Feature	Units	Value	Source/comment
Reservoir capacity	m ³	59,000	S10 Report (2017)
Reservoir area at TWL	m ²	18,000	
Levels			
Crest – lowest point	m AOD	31.12	S10 Report (2017)
Top water level	m AOD	28.05	
Ground level at downstream toe	m AOD	19.50	Bank contour survey by Acad Mapping Ltd (2007)
Stream bed at downstream toe	m AOD	19.00	S10 Report (2017)

2.4 Description of the Valley Downstream of the Reservoir

The channel downstream of the dam reaches the sea (English Channel) after about 2.5km, passing adjacent to buildings and other infrastructure on the way as shown in Table 2.2 below. The watercourse is contained within a culvert for its entire length downstream of the park as far as the sea.

Table 2.2: Features downstream of dam (adapted from 2017 S10 Report)

Distance d/s (km)	Feature at start of reach	Remarks, features within downstream reach (all dimensions approximate – estimated visually)
		Model railway and paths along valley
0.3	Two houses (semi-detached)	Buckhole Cottages, 1 St Helen's Rd, Hastings TN34 2EL
0.4	Gardeners workshops	Workshops have stream running below buildings. Formal gardens, and then tennis courts just upstream of Dordrecht Way
0.7	Dordrecht Way	Road across valley on 3m high embankment. Stream passes under in culvert (800mm diameter) on south side Valley downstream includes: a) Some ponds which are being used to improve water quality through use of reed beds etc (in order to improve bathing water quality, which was reported as a marginal failure before these works but now much improved) b) Café part way up the side of valley Base of valley 2 to 3m below roads along the side of the valley
1.5	Bethune Way/railway	Stream passes into 800mm culvert which continues under the urban area of Hastings to the sea, discharging on the beach below high tide The crest of road slopes down to the roundabout at the left side of the park and during extreme floods, water would flow down the A2101 (the railway is on a viaduct above the road)
2.5	English Channel	

2.5 Reservoir Flood Assessment

Previous estimations have been made of peak inflows at Buckhole Reservoir of which the most noteworthy up to date are those provided in the 1996 S10 Inspection Report. The latest S10 Inspection Report (2017) estimated peak inflows by using the 'rapid method' and the values were found to be much smaller than those given in the 1996 Report. The 2017 S10 report states that the higher numbers from the 1996 report are likely to be reasonable, and it should be noted that the 'rapid method' is a generic approach, with many simplifications, to provide a quick indication only of the scale of flood flows. For instance, it poorly represents catchments where the course of the stream is not clearly defined, and it does not accurately deal with highly urbanised catchments.

Previous estimates of peak inflow values are summarised in Table 2.3 below.

The 2017 S10 Report confirmed that the dam containing Buckhole Reservoir is a **Category A** dam implying that:

- The 1 in 10,000 chance per year flood should be adopted as the design flood, i.e. the flood that should be passed by the spillway arrangements without any damage;
- The Probable Maximum Flood (PMF) should be adopted as the safety check flood, i.e. the flood that may cause some damage to the dam but should not lead to a breach of the dam and a subsequent uncontrolled release of the reservoir.

Table 2.3: Summary of previous estimates of peak inflows

Flood event	1996 S10 Inspection		2017 S10 Inspection
	Peak inflow	Peak outflow	Peak inflow (Rapid Method)
Safety Check Flood (PMF)	59.1 m ³ /s	47.7 m ³ /s	27 m ³ /s
Design Flood (10,000-year Flood)	34.1 m ³ /s	31.6 m ³ /s	-

In view of the shortcomings associated with the 'Rapid Method', noted above, and the need to ensure a robust approach can be demonstrated, the 1996 S10 Inspection values (highlighted in red above) were adopted for the purpose of this study.

2.6 Existing Siphon Spillway and Downstream Chute

2.6.1 General

The current spillway structure was constructed in 1985 and comprises five flow paths of which one is a normal weir and the other four are siphon structures. The five spillway openings discharge into a siphon chamber from which water is directed to the spillway channel which follows the right mitre of the dam. The first section of the spillway channel (which was constructed as part of the 1985 works) comprises a rectangular reinforced concrete channel which turns through 90 degrees and then reduces in section to connect to the original trapezoidal overflow channel some 15m further along the mitre of the dam. The new (1985) section of channel has a length of about 35m after which it ties into the much smaller original overflow channel which has a length of about 45m before it joins the channel from the left mitre at the central toe of the embankment from where it flows downstream in a single channel further into Alexandra Park. Figure 2.2 shows the general plan layout of the siphon chamber and spillway channel. Figure 2.3 shows various sections through the 1985 spillway arrangements.

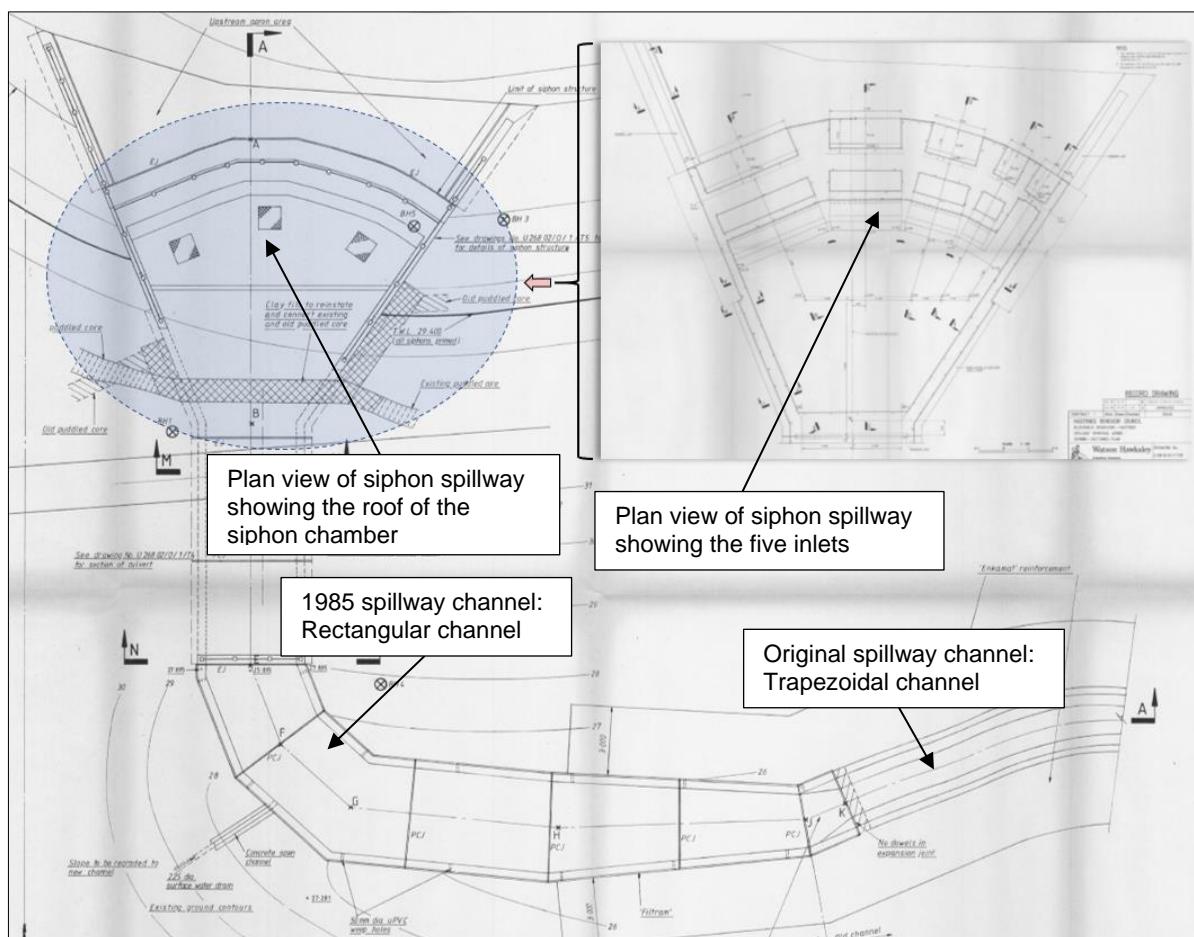


Figure 2.2: General layout of the spillway at Buckhole Reservoir

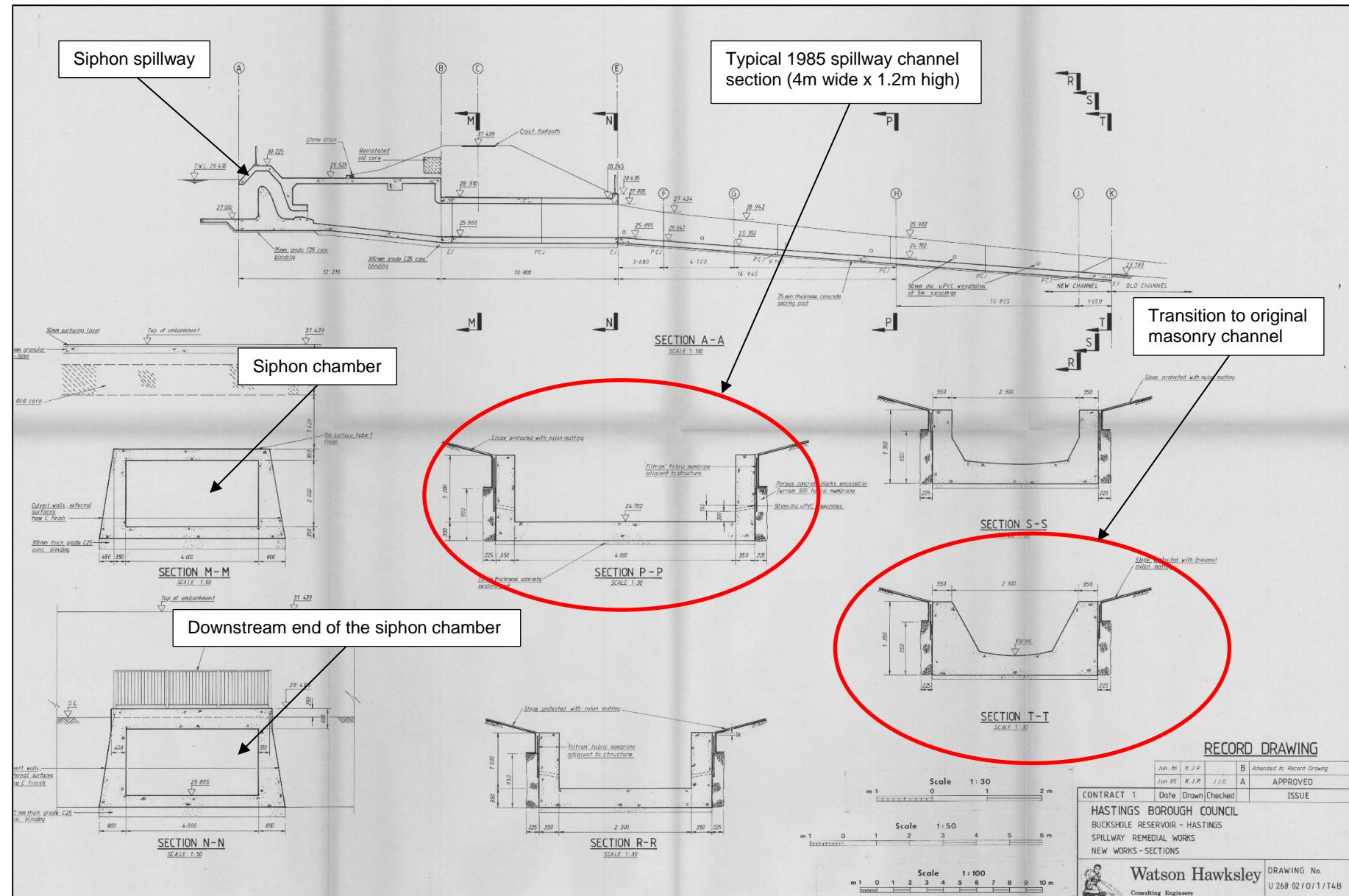


Figure 2.3: Long and cross-sections of the 1985 siphon spillway and downstream chute

2.6.2 Siphon Spillway Capacity

A rating curve for the siphon spillway was included in the previous S10 Report (2017). This rating curve (shown in Figure 2.4 below) was produced based on the results of a model test that was conducted at Newcastle University.

The rating curve shows that the spillway is able to discharge about 54m³/s with the water level in the reservoir at dam crest level (just before overtopping of the dam occurs). The previous S10 stated: "*It is concluded that the spillway weir does meet the standard recommended by the ICE for a Category A dam of passing a design flood of 1 in 10,000 chance per year with no damage, and a PMF flood without failing.*"

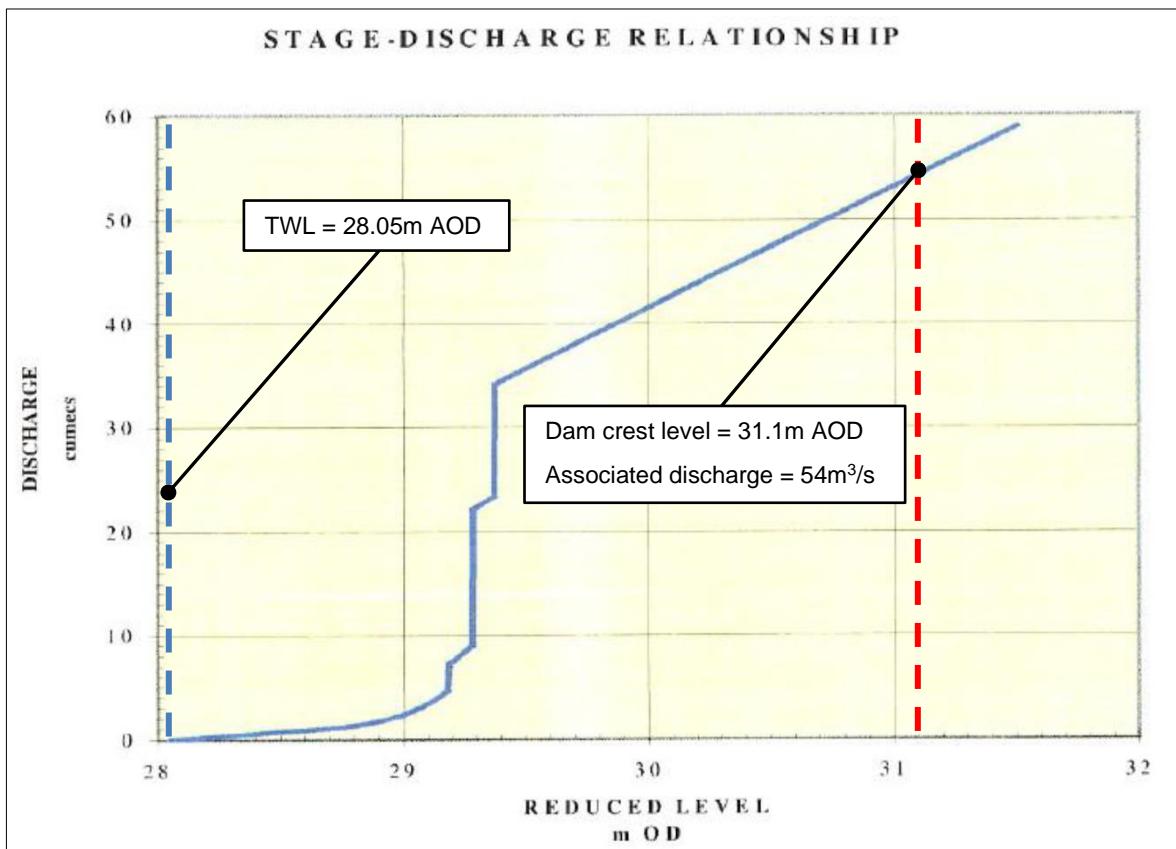


Figure 2.4: Rating curve for the siphon spillway at Buckhole Reservoir

2.6.3 Original Spillway Channel Condition

The original masonry channel was described in the last Section 10 Inspection Report (2017) as follows:

"This is in poor condition and over the years the invert has been patch repaired by relining with mass concrete. However, this prevents drainage, such that water is forced upwards and spurts through the masonry sides. I recommend that as part of the review of the hydraulic capacity of the spillway channel, consideration is given to replacing the left bank (spillway) channel with a non-erodible lining."

Hastings Borough Council has taken steps to improve the condition of the spillway chute as a short-term measure, recorded in the Prescribed Form of Record and in recent Annual Statements by the Supervising Engineer [2017, 2018 & 2019 (Draft)], as follows:

Annual Statement	Remarks on condition of the original spillway channel
2017	<i>During the first half of 2017 council operatives have spotted a sinkhole behind the left side wall of the spillway channel, approximately half way along the route of the channel. Water could be seen flowing at the base of the sinkhole. Hastings Borough Council has reported that the void is believed to extend for several metres. It is apparent that water is flowing at a significant rate through either a joint in the base of the channel or through joints in the channel side walls. Further investigations should be carried out as soon as possible to identify and then seal the source</i>

Annual Statement	Remarks on condition of the original spillway channel
	<p>of the leak. The void should be fully uncovered, and poor quality fill material removed as far as practicable, and the excavation reinstated with a suitable low permeability fill, such as clay, compacted in layers, and ensuring good contact with the face of the channel wall. The Supervising Engineer should be notified of the source of the leak, once found, and notified again when the remedial work has been completed.</p> <p>Upon closer inspection, it was noted that filler material was missing from the joints in the base of the channel. As soon as conditions allow the joint material in the base of the channel should be reinstated, using an appropriate and modern sealant, such as a polyurethane based product.</p>
2018	<p>The sinkhole observed in 2017 has been fully investigated by Hastings BC. The source of water passing through the left hand wall of the channel has been addressed and the sinkhole repaired using clay following removal of poor quality fill and other loose material.</p> <p>A number of joints in the invert of the channel require the re-application of an appropriate sealant. As soon as conditions allow, the joint material in the base of the channel should be reinstated, using an appropriate and modern sealant, such as a polyurethane based product.</p> <p>It was noted that in a number of places mortar is loose or missing from joints between masonry units. A programme of re-pointing the masonry lining should be implemented.</p>
2019 (Draft)	<p>The invert of the channel, constructed of concrete, is generally in a satisfactory condition. The walls are generally of masonry construction and in a deteriorating condition. Mortar is missing in many places and re-pointing is required. Towards the bottom of the channel there is significant vegetation growing through the joints between masonry units. All vegetation in the channel should be cleared, and open joints between masonry units, and joints where the mortar is loose should be re-pointed.</p>
Prescribed Form of Record	Remarks on condition of the original spillway channel
Jan-2018	<p>Left channel block work walls phase 1 repointing</p> <p>A 5.7m section of the left abutment mitre channel [spillway channel] was repointed starting from the junction eastwards and as far down the wall as the flowing water would allow. Loose pointing and vegetation was raked out and new pointing applied between the block-work.</p>
Oct-2018	<p>Left channel block work walls phase 2 repointing</p> <p>A 5.7m section of the left abutment mitre channel [spillway channel] was repointed starting from the end of phase 1 eastwards and as far down the wall as the flowing water would allow. Loose pointing and vegetation was raked out and new pointing applied between the block-work.</p>
Sep-2019	<p>Left channel block work walls phase 3 repointing</p> <p>A 5.7m section of the left abutment mitre channel [spillway channel] was repointed starting from the end of phase 2 eastwards and as far down the wall as the flowing water would allow. Loose pointing and vegetation was raked out and new pointing applied between the block-work.</p>

2.6.4 Spillway Channel Capacity

The capacity of the existing spillway channel was assessed at a high level for the purpose of this study by modelling the arrangement using HEC-RAS 5.0.5 software. It should be noted that this assessment did not model the effects of water flowing around bends and was used only to estimate the normal flow capacity of the existing arrangement. The existing capacity of the channel was estimated to be in the order of 10m³/s, with the transition between the new (1985) and the original channel causing a significant restriction to flow due to the decrease in cross-sectional area.

In addition to the HECRAS modelling, the capacity of the chute around the bend was checked by using the methodology described in RARS Section 8.2.3. The capacity of the chute around the bend, before water is expected to overtop the its sidewalls due to air entrainment and super-elevation, was found to be in the order of 30m³/s (this is marginally smaller than the design flood outflow – see Table 2.3).

The condition of the original trapezoidal chute sidewalls (see 2.6.3 above) is such that, at high velocities (exceeding 8m/s) it is expected that damage may be incurred in the form of masonry blocks being 'plucked out' or pushed out due to pressure of water behind the wall causing the onset of erosion of the adjacent embankment fill material. Based on the hydraulic assessment, such damage to the sidewalls is expected to commence even before the capacity of the channel is exceeded.

The last S10 Inspection Report (2017) made the following statement regarding the spillway channel capacity:

"In larger flows water will come out of the channel and start to erode the downstream face of the dam. The magnitude of flow and annual chance of failure cannot be estimated reliably without a detailed model study, but it is suggested that erosion sufficient to breach the dam and release the reservoir is quite likely at the 1 in 1,000 chance per year flood."

It is considered that the spillway channel does not meet the standards for a Flood Category A dam."

2.7 ALARP Assessment

The current Floods & Reservoir Safety 4th edition (FRS4) guidance allows for both a standards-based approach and a risk-based approach when assessing the safety of existing reservoirs.

The standards-based approach follows a set methodology which determines the physical requirements for a dam and spillways to ensure extreme flood events can be passed safely whilst ensuring the integrity of the dam and spillway structures. The required standard depends on the category of the dam, reflecting the anticipated loss of life and extent of damage, or downstream consequences in the event that the dam was to fail.

The FRS4 guidance states that '*Where expenditure on remedial works will be significant to meet the standards-based approach to dealing with floods ... a risk-based approach could be adopted to assessing the value (cost versus reduction in risk) of undertaking remedial works'*'.

This approach is an industry accepted approach aimed at reducing risk 'as low as reasonably practicable' (ALARP) and is referred to here as an ALARP approach. It follows a rigorous and logical methodology with the aim of identifying options for improvement works that would reduce the risk of failure of a dam to an acceptable level at a cost that is proportionate to the reduction in risk achieved. According to the Health and Safety Executive guidance, the risk has been reduced to an acceptable level where the 'cost to save a life' (see equation below) is less than the 'value of preventing a fatality' (VPF).

$$\text{Cost to save a life (CSL)} = \frac{\text{Cost of risk reduction works}}{\text{Reduction in "likelihood of failure" } \times \text{likely loss of life}}$$

The Department for Transport's assessed VPF for road and rail for 2010 was £1.7 million. However, for dams, where the risk to those in the potential inundation area is involuntary (in that the public are not generally aware of the risk from dams) it will be assumed that the assessed VPF for dams should be approximately 5 times more than that for roads and railways. Thus, for dams, where CSL is less than $5 \times £1.7M = £8.5M$ it is considered proportionate to carry out the works.

In simple terms the risk has been reduced to an acceptable level when the following holds true:

$$\text{Proportionality Factor (PF)} = \frac{\text{Cost to save a life (CSL)}}{\text{Value to prevent fatality (VPF)}} < 5$$

More information on the ALARP approach and the rationale behind choosing an appropriate disproportionality factor for dams is provided in **Appendix B**.

3 Existing Arrangements – Probability of Failure

3.1 Introduction

This section defines the current annual probability of failure. This is combined with the consequences of failure in the next section, to give the annual risk, which is a combination of probabilities and consequences.

The standards in terms of the flood passing capability of a reservoir recommended by the ICE (2015) are summarised in Table 3.1 below.

Table 3.1: Recommended standards for flood safety at category A dam (ICE, 2015)

Feature	Design Flood (see Note 1)	Safety Check Flood (see Note 1)
Requirements	No damage (safety margin provided by agreed freeboard)	Safety of dam cannot be assured for floods greater than this
Annual chance of flood	1 in 10,000	Probable maximum flood (PMF)
Wave freeboard	<p><i>The larger of</i></p> <ul style="list-style-type: none"> • freeboard to reduce wave overtopping to zero (i.e. < 0.001 l/s/m) with mean annual wind or • specified minimum freeboard of 0.6m 	Quantity of wave overtopping does not exceed that for “marginally safe performance” – interpreted as 1 litre/sec/m wave overtopping rate for embankment dams with a good grass cover (or Tables 6.2, 6.3 of FRS4 or such higher value as assessed by panel engineer).
Notes:		
1. Standards defined in Process diagram in Appendix 3 of ICE 2015		

3.2 Screening of Possible Failure Modes

Possible failure modes associated with floods are summarised in Table 3.2 below. It should be noted that the scope of the current risk-based study is limited to failure mode no. 2 although where deemed necessary energy dissipation measures have been incorporated into the options that are considered as part of this study.

Table 3.2: Possible failure modes associated with floods

No.	Failure mode	Comment
1	Crest overtopping ⁽¹⁾	May occur if weir/ siphons block
2	Spillway channel failure / overtopping	Main object of this study – Interests of safety recommendation in last s10
3	Erosion at toe of dam ⁽²⁾	Hydraulic jump would occur where supercritical flow down chute meets flatter valley floor. Stilling basin normally provided to prevent erosion, but currently there is no such installation at Buckhole Reservoir
Notes:		
<p>(1) The previous S10 report stated: “It is concluded that the spillway weir does meet the standard recommended by the ICE for a Category A dam of passing a design flood of 1 in 10,000 probability per year with no damage, and a PMF flood without failing.” The available freeboard from the overflow spillway crest to the crest road of the dam is 3.07m, which is considered adequate. Therefore, no further risk-based work related to this failure mode is required at present.</p> <p>(2) The ALARP study was not carried out for this failure mode as it was considered that the most likely failure mode would be the progression of erosion due to failure of the masonry side wall. However, to reduce the likelihood of erosion at the toe of the dam, the options that were developed as part of this study have allowed for some form of stilling basin at the toe to improve on the current situation.</p>		

3.3 Existing Probability of Failure

3.3.1 General

In 2007 an incident occurred at Ulley Reservoir in South Yorkshire where, during a significant rainfall event, the older masonry spillway channel side wall failed. As a result, significant erosion of the dam fill material occurred in a relatively short space of time leading to a risk of dam breach and

failure. This incident was identified as a relevant case study to assist the process of predicting the failure mechanism that is most likely at Buckshole Reservoir. These reservoirs were found to be reasonably similar in terms of spillway channel arrangements and embankment materials.

A study of the events that occurred at Ulley Reservoir was carried out, with more details given in **Appendix F**. This study assisted in making reasonable assumptions as to the likely failure mechanism and erosion rates at Buckshole Reservoir, with the procedure described in more detail below.

3.3.2 Event Tree Analysis

For failure mode no. 2, it was considered that the following sequence of events would need to occur (graphic representation of the steps shown in Figure 3.1 below):

- Significant rainfall event occurs in the catchment leading to a rise in the water level causing the spillway to operate with associated flow down the spillway channel.
- The combination of depth of flow, velocity and turbulence in the channel causes the onset of damage to the masonry side walls of the original spillway channel, e.g. by the 'plucking out' of masonry blocks or pushing them out by water pressure from behind.
- The ongoing flow in the spillway channel causes total failure of the side walls.
- The failure of the side walls leads to the erosion of the adjacent embankment material.
- Erosion scour progresses upstream and the residual eroded cut slope within the embankment material becomes increasingly unstable for a slip surface that intercepts the upstream edge of the crest.
- The scour progresses sufficiently upstream and the catastrophic failure of the residual cut slope causes a breach in the dam and an uncontrolled release of the reservoir.

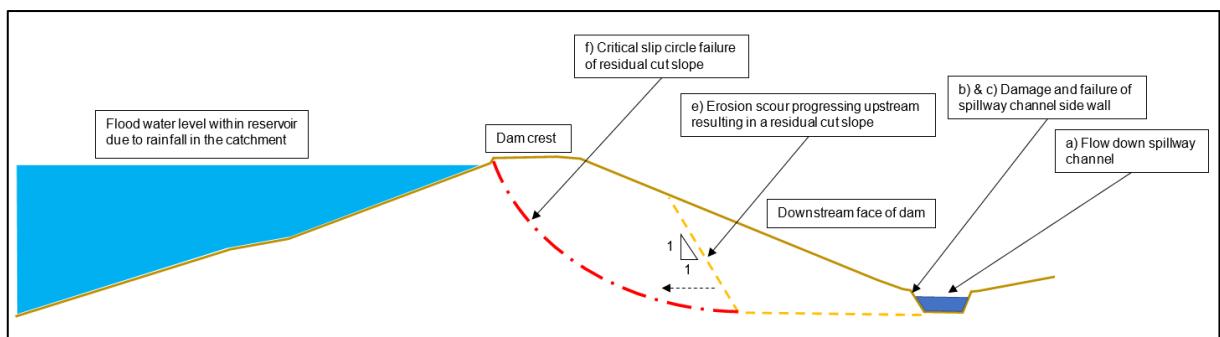


Figure 3.1: Visual presentation of the sequence of events that would lead to failure

An event tree was developed to logically list out the steps to failure of the dam for a particular flood event. The event tree is given in Figure 3.2 below and this was further developed by adding probabilities related to a range of flood events with the sections below providing the basis for how these probabilities were estimated. The fully populated event trees are shown in **Appendix D**.

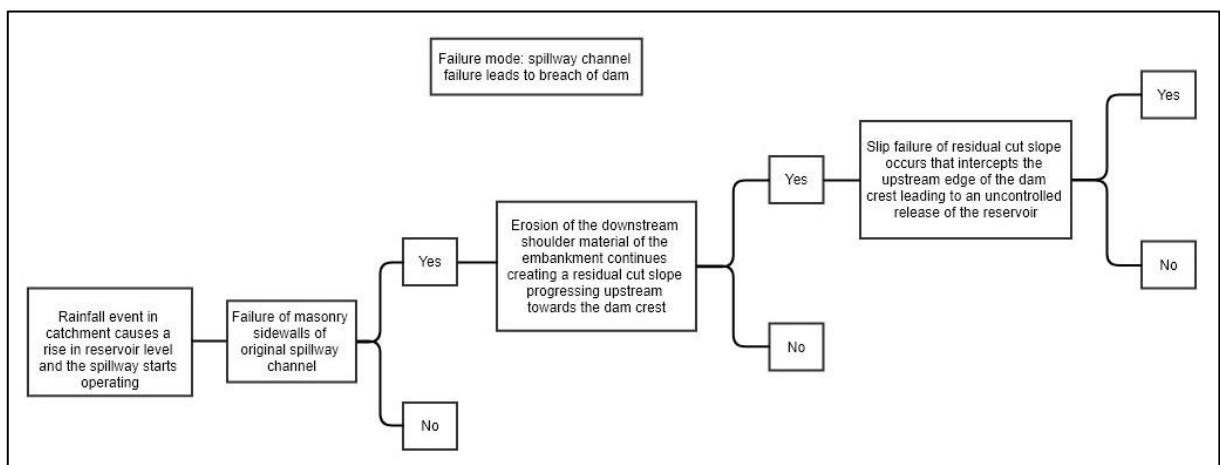


Figure 3.2: The event tree that lists out the logical steps that would lead to failure

3.3.3 Failure of the Masonry Channel Sidewall

The high-level HECRAS assessment showed that the peak velocity in the masonry channel is likely to occur at its upstream end where the 1985 spillway channel reduces and joins the masonry section. Due to their current condition, the masonry sidewalls are deemed to be at risk of failure when high velocity and turbulent flow is present in the channel. Failure is likely to progress rapidly once masonry blocks have started to be 'plucked out' or pushed out by water pressure behind the wall.

The likelihood of such a failure occurring is a matter of judgement and so a fragility curve was produced in order to give a reasonable estimate of the relationship between the likelihood of channel sidewall failure and velocity of flow down the channel. The fragility curve was developed through a collaborative process involving discussions with the QCE and a study of literature of similar failures that have occurred in the past. It is specifically noted that the peak channel velocities in the case of the Ulley Reservoir incident were estimated to have been in excess of 8m/s. In this case, the high velocities and turbulent nature of the flow in the channel would appear to have been sufficient to generate high enough internal water pressures within the masonry for stones to be extracted. However, the form of the spillway channel at Ulley Reservoir, comprising a series of stepped plunge pools, probably exacerbated the situation (Hinks *et al*).

The event likelihood descriptors and associated estimated factors that were used to develop the fragility curve were adapted from Mason (2010) and these are given in Table 3.3 below. The fragility curve is shown in Figure 3.3 below.

Table 3.3: Event likelihood and associated estimated factors [adapted from Mason (2010)]

Likelihood descriptor	Likelihood factor
Impossible	0
Virtually Impossible	0.001
Highly Unlikely	0.01
Very Unlikely	0.05
Unlikely	0.1
Possible	0.3
Neutral	0.5
Probable	0.7
Very probable	0.9
Highly probable	0.99
Virtually certain	0.999

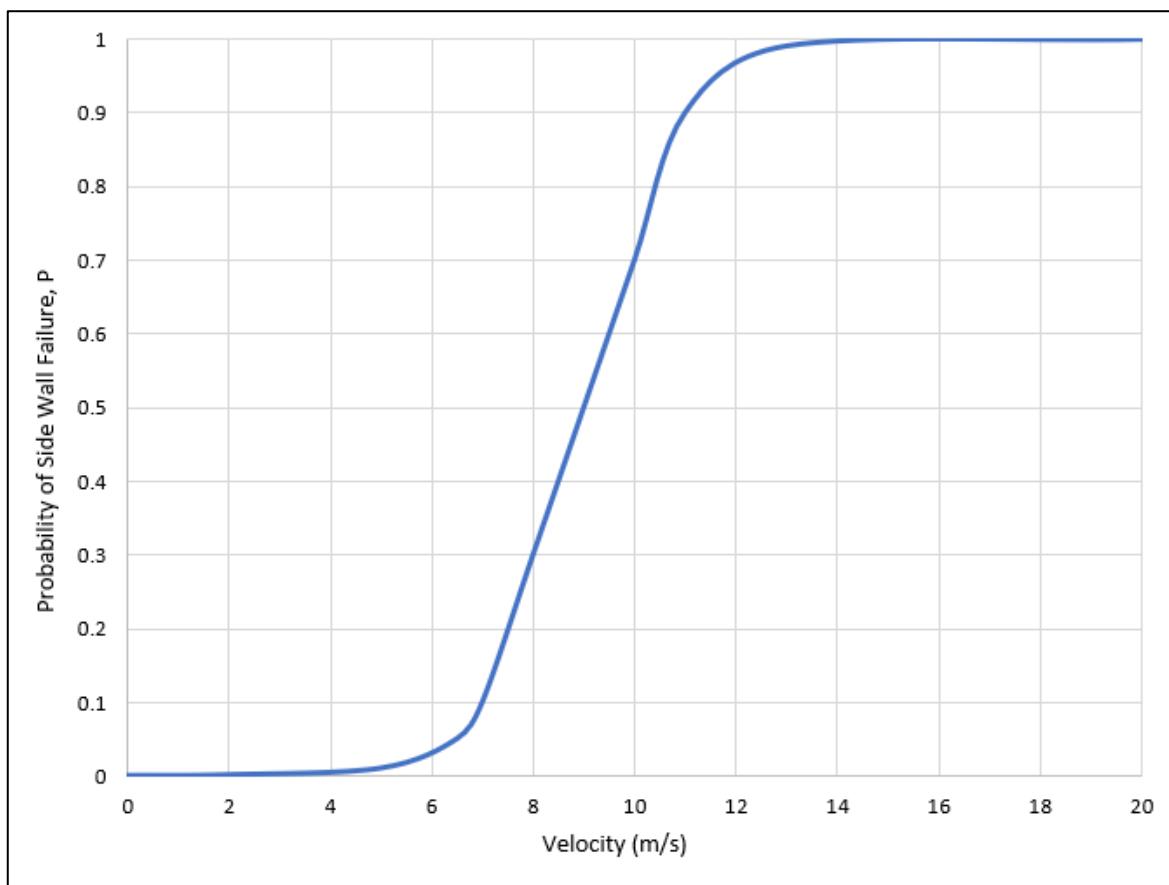


Figure 3.3: Fragility curve produced for the masonry channel at Buckhole Reservoir

In summary, the fragility curve indicates that there is a 10% probability of failure of the masonry channel side wall during flow velocities of around 7m/s, a 50% probability with flow of around 9m/s and a 90% probability with flow of around 11m/s.

3.3.4 Erosion Rate of the Embankment Material

The erosion rate of soil material is highly dependent on the soil state, i.e. a highly compacted soil will take much longer to erode when compared to a loosely compacted soil. The erosion rate of a soil is generally described in the industry by an empirically derived erodibility coefficient, K_d . Other factors such as flow depth, flow velocity and critical shear strength of the soil also play a major role in estimating the erosion rate of the material. The industry accepted equation for estimating erosion rates of soil materials has been used in this assessment and can be expressed as follows (RARS, 2013):

$$\dot{E} = K_d(\tau - \tau_c)$$

where,

\dot{E} = erosion rate of soil;

K_d = erodibility coefficient;

τ = the hydraulically applied boundary stress;

τ_c = the critical shear strength of the soil.

The erodibility coefficient varies based on the soil type, density, water content and plasticity, and is considered to be the dominant parameter affecting erosion rate, but also the most difficult parameters to estimate accurately. To assist with its characterisation, a simple table, shown below, was developed by Hanson *et al* in 2001.

Table 3.4: Typical erodibility coefficients (Hanson et al, 2001)

Erodibility	K _d (cm ³ /N-s)
Very Erodible	1 to 5 (or more)
Erodible	0.05 to 2
Moderately Resistant	0.01 to 0.5
Resistant	0.001 to 0.4
Very Resistant	0.0005 (or less) to 0.1

For this assessment it has been assumed that, upon failure of the masonry sidewalls, erosion is expected to progress rapidly into the downstream shoulder material of the embankment. An assessment of the rate of erosion head cut was made assuming that the masonry channel fails every time at the peak velocity of the flow in the channel for different flood events. The results of the study into the Ulley Reservoir incident were used to determine a reasonable erodibility coefficient for the shoulder material at Buckhole Reservoir.

In the case of the Ulley Reservoir incident, literature suggests that the rainfall event was approximately 18 hours long, and the total damage period was approximately 15.5 hours long. Therefore, the estimated 8m head cut occurred over 15.5 hours, which gives a constant erosion rate over this period of approximately 520mm/hr. This is consistent with an erodibility coefficient of K_d=0.1 for a moderately erodible material (USBR, 2018) and for a flow depth of 1.5m (approximate height of the Buckhole spillway chute wall).

However, due to the fact that the erodibility coefficient and erosion rate for Ulley are constant averaged values, and in reality the rate would more likely have varied significantly during the flood event, it is considered reasonable to assume a higher erodibility coefficient value for the Buckhole assessment. This would allow for the variation of the erosion with time, flow velocity and flow depth. Therefore, the upper limit erodibility coefficient of K_d= 0.5 for a moderately erodible material has been assumed for this assessment. This may also be considered a conservative erodibility coefficient.

Refer to **Appendix F** for more details on the Ulley Reservoir case study.

3.3.5 Stability of Residual Slope

Out of channel flow from the spillway chute will result in erosion, or 'head cut' of the embankment material. The rate of head cut will be a factor of the amount of out of channel flow and the stability of the residual slope of the embankment as the head cut progresses towards the dam crest.

For the analysis the residual slope, as the erosion progresses, was assumed to have a gradient of 1:1. This assumption reflects a typical soil where a 1:1 gradient can be expected to be unstable. The internal angle of friction was conservatively assumed to be 25° and the cohesion 0 kPa.

For the range of flood events considered, the stability of the residual slope was calculated for a critical dam failure slip circle that intercepts the upstream edge of the crest. Each factor of safety was then converted to an annual probability of failure by using Figure 8.4 in RARS (reproduced for the purpose of this report as Figure 3.4 below).

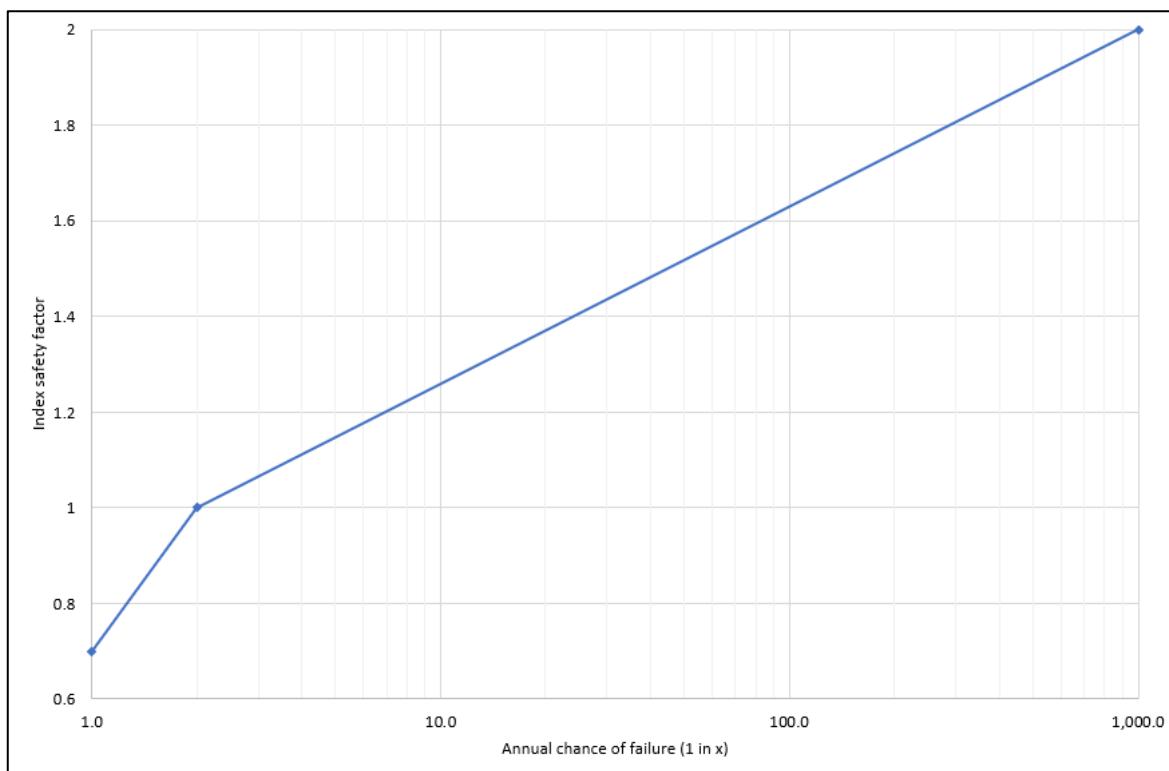


Figure 3.4: Relationship of the slope safety factor to annual probability of failure (Figure 8.4 in RARS 2013)

In summary, the relationship indicates that for a factor of safety of 1 the probability of failure is 1 in 2 or 50%, and for a factor of safety of 1.5 the probability of failure is around 1 in 45 or 2%.

3.3.6 Summary

The following table (Table 3.5) summarises the values that were calculated for each of the steps in the event tree for a range of different flood events. These were then converted to annual probabilities which are summarised in Table 3.6 below.

Table 3.5: Summary of the calculated values for each flood event that were used during the determination of the annual probability of failure

Flood event		Estimated peak velocity in masonry channel ⁽¹⁾ (m/s)	Erosion head cut assuming masonry sidewall failure ⁽²⁾ (m)	Safety factor of residual slope assuming erosion head cut ⁽³⁾
Annual probability (1 in x)	Annual probability			
10	1.0×10^{-1}	5.6	1.9	1.0
100	1.0×10^{-2}	7.2	2.9	0.9
500	2.0×10^{-3}	8.0	3.6	0.9
1,000	1.0×10^{-3}	8.9	4.4	0.8
10,000	1.0×10^{-4}	11.9	7.7	0.7
400,000 (PMF)	2.5×10^{-6}	13.7	7.7	0.7

Notes:

- (1) A HECRAS analysis was used to estimate the peak velocity for each flood event. Refer to Section 3.3.3 above for a description of how velocity is linked to the failure of the side wall.
- (2) An erosion head cut analysis was used to estimate the amount of erosion head cut for each event assuming side wall failure at the peak velocity in the channel. Refer to Section 3.3.4 above for a description of how the erosion head cut was calculated.
- (3) A Slope/W analysis was used to estimate the safety factor of the residual erosion cut slope for each event assuming side wall failure. Refer to Section 3.3.5 above for a description of how slope stability affects the probability of failure.

Table 3.6: Summary of the annual probabilities of failure that were calculated during the event tree analysis

A - Flood event		B - Annual probability of channel sidewall failure⁽¹⁾	C - Annual probability of slope failure considered sufficient to fail the dam⁽²⁾	Combined annual probability of failure [A x B x C]
Annual probability (1 in x)	Annual probability			
10	1.0×10^{-1}	2.0×10^{-2}	5.0×10^{-1}	1.0×10^{-3}
100	1.0×10^{-2}	1.0×10^{-1}	6.7×10^{-1}	6.7×10^{-4}
500	2.0×10^{-3}	3.0×10^{-1}	6.7×10^{-1}	4.0×10^{-4}
1,000	1.0×10^{-3}	5.0×10^{-1}	8.3×10^{-1}	4.2×10^{-4}
10,000	1.0×10^{-4}	9.5×10^{-1}	9.99×10^{-1}	9.4×10^{-5}
400,000 (PMF)	2.5×10^{-6}	9.9×10^{-1}	9.99×10^{-1}	2.5×10^{-6}
Overall annual probability of failure (Σ of all combined probabilities)				2.6×10^{-3}
Approximate corresponding overall annual probability of failure (1 in x)				400
Notes:				
(1) Refer to Figure 3.3 above.				
(2) Refer to Figure 3.4 above. This assumes that erosion has occurred (onset of erosion assumed to have a probability of 1).				

4 Downstream Consequences of a Dam Breach

4.1 General

This section summarises the available EA Reservoir Flood Mapping and the consequence assessment that was carried out in conjunction. Further, the results of an alternative dam break analysis which was carried out by CC Hydrodynamics Ltd for the purpose of this study, is discussed.

One of the important considerations in estimating the likely consequence of dam failure is the extent to which warning, and evacuation may be effective. Although there is an on-site plan, which should in theory reduce the probability of failure, if the dam did fail the number of people at risk and the lack of a site-specific off-site plan mean that evacuation cannot be relied upon. *As is normal in UK, which is to follow a precautionary approach, for this ALARP analysis it is assumed that warning may not be effective.*

4.2 National Reservoir Flood Mapping (RFM, 2009)

In 2009 the Environment Agency carried out national flood mapping of all large raised reservoirs in England and Wales. This mapping is available online at <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>.

The extents of inundation on the website is reproduced in Figure 4.1, and shows flooding downstream of the dam for the 1.5km through Alexandra Park to Bethune Way. Here the stream passes into an 800mm diameter culvert which continues under the urban area of Hastings to the sea, discharging on the beach below high tide. The extent of flooding is shown to be mostly contained within Alexandra Park and does not extend beyond Bethune Way which is located on a slightly raised embankment. It should be noted that the mapping includes the inundation due to the failure of Shornden Reservoir which would cause flooding within the same valley.

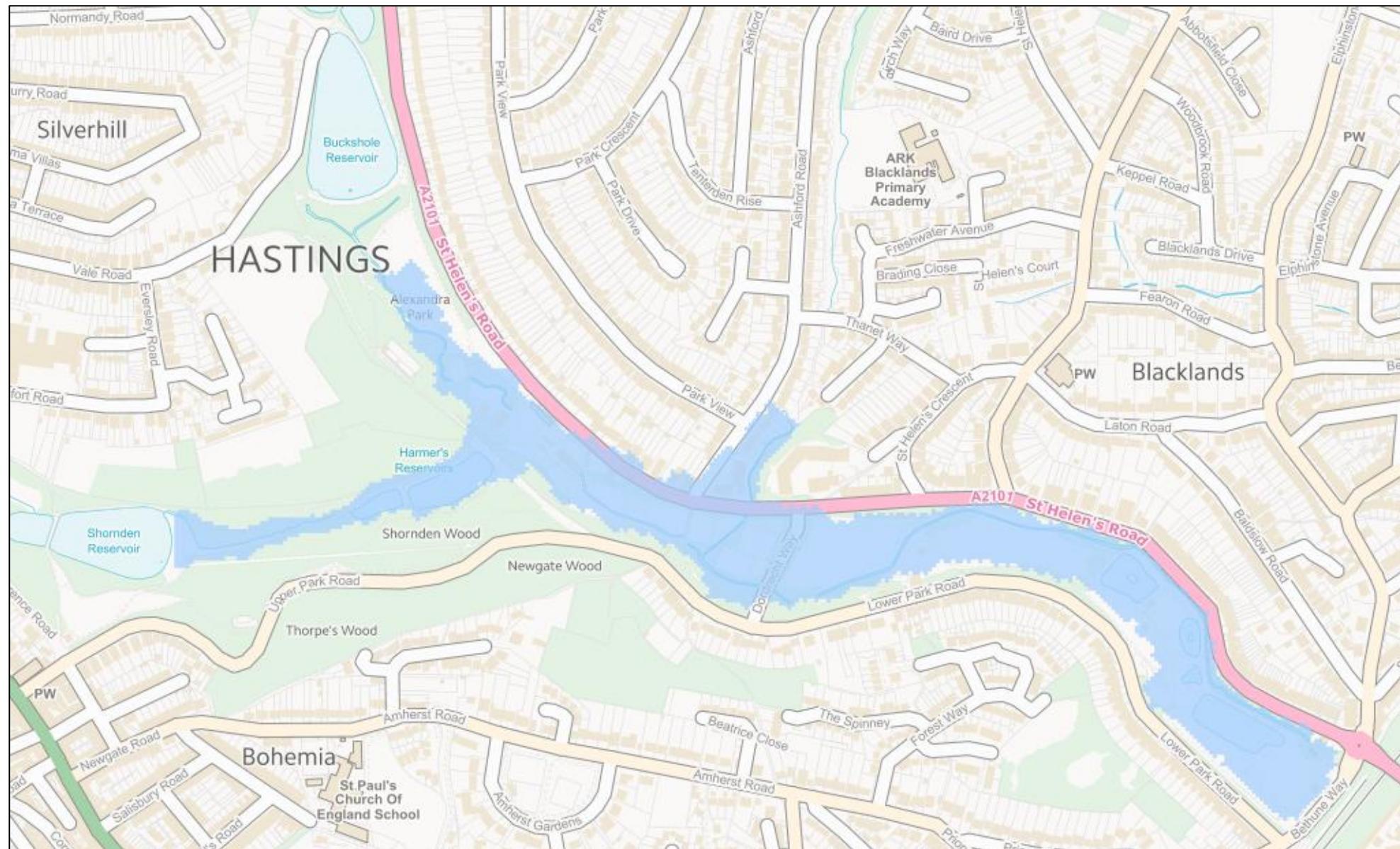


Figure 4.1: Flood inundation mapping due to reservoir failure (RFM, 2009)

4.3 Updated National Reservoir Flood Mapping (RFM, 2016)

The EU Floods Directive requires member countries to review, and if appropriate, update their flood maps every six years. The Environment Agency is in the process of updating the reservoir flood mapping (RFM, 2016) in England, aiming to update as many of the maps as possible by the EU 2019 deadline. The new mapping includes the effect of an extreme fluvial flood (1 in 1,000 chance per year) with and without dam failure, in order to separate the impacts of the fluvial flood from the incremental impacts of a dam failure. In addition, the dry day failure is also included. Updated reservoir flood mapping has already been carried out for Buckhole Reservoir and these results were made available for the purpose of this study.

The latest EA reservoir flood maps for Buckhole Reservoir were completed in October 2017 and are included in **Appendix C** of this report. The maps include the maximum flood extents for both a wet day (fluvial flood extents included) and a dry day (no fluvial flooding included) reservoir failure. The incremental flood inundation for a wet day failure is shown which represents the increased flooding extent due to the failure of Buckhole Reservoir (see Figure 4.2 below).

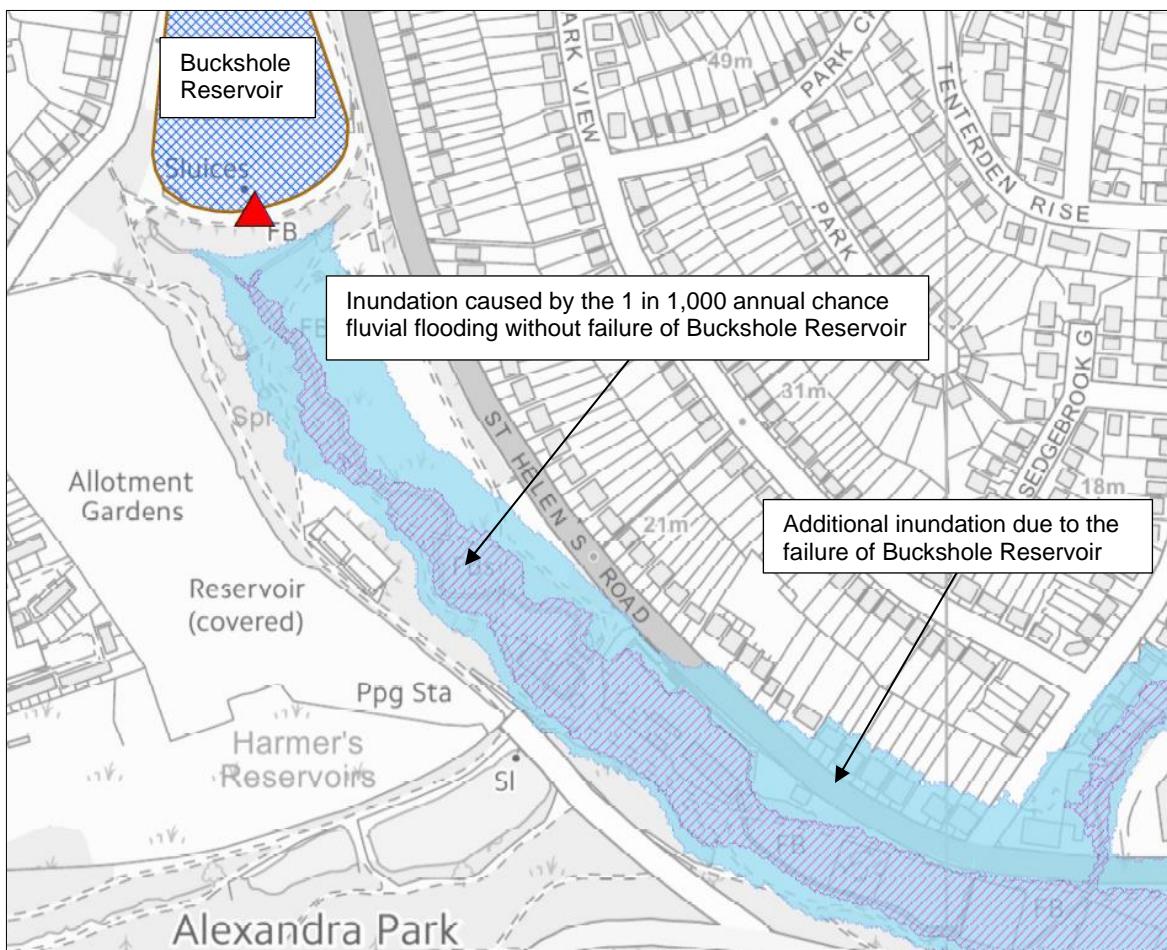


Figure 4.2: Excerpt from the EA Reservoir Flood Map for a wet day failure (RFM, 2016)

4.4 Impact of Dam Failure on People

The preliminary results from the updated EA Reservoir Flood Mapping showing downstream impacts (consequences) have been reviewed by Stillwater Associates. These are summarised in Table 4.1 below.

Table 4.1: Results of the consequence assessment stemming from the updated RFM (2016)

Consideration	1 in 1,000 year fluvial flood	Rainy day dam failure	Incremental effect of dam failure
Properties affected	26	687	661
Maximum population at risk	45	1931	1886
Time-averaged population at risk	24	1032	1008
Likely loss of life	0.03	4.87	4.84
Property damage	£1.06 M	£40.1 M	£39.0 M

Stillwater Associates carried out a review of the number of properties at risk of flooding by using the 2016 EA Reservoir Flood Maps in combination with Google Street View and Google Earth. The number of properties affected has been estimated to be in the order of 300, which is significantly lower than the value given by the EA. It was therefore considered appropriate to carry out an updated dam break assessment in order to verify the values. This is further discussed in the following section.

4.5 Updated Dam Break Analysis and Consequence Assessment

An updated dam break assessment was commissioned for the purpose of this study and was carried out by CC Hydrodynamics Ltd (CCH). CCH carried out a detailed review of the population and property at risk from a wet day failure scenario as an alternative to the EA RFM numbers. Initially, only the PMF case was investigated and the numbers below were generated.

Table 4.2: The results obtained for a dam break during the PMF event

Consideration	Rainy day base (flood routed through the reservoir)	Rainy day dam failure	Incremental effect of dam failure
Population at risk	1030	1250	220
Likely loss of life	1.39	3.9	2.5
Cost of 3 rd party property damage	£79.5 M	£94.6 M	£15.1 M

However, it is noted that the PMF scenario is very conservative and, with reference to section 3.3 above, it is expected that the dam may fail during flood events that are more likely than the PMF. It was thus decided to consider a dam break during the 1 in 1,000 annual chance flood event and the numbers below were generated.

Table 4.3: The results obtained for a dam break during the 1,000-year flood event

Consideration	Rainy day base (flood routed through the reservoir)	Rainy day dam failure	Incremental effect of dam failure
Population at risk	19	766	747
Likely loss of life	0.02	0.85	0.83
Cost of 3 rd party property damage	£0.45 M	£10.5 M	£10.0 M

At this stage it became apparent that a local maximum incremental scenario may be present somewhere between the 1 in 1,000 annual chance and the 1 in 10,000 annual chance events. The reason for this is that up to a point fluvial flooding is wholly contained within Alexandra Park and the

downstream culvert, without resulting in property flooding downstream. If the dam failure was to occur when the fluvial flood had filled the storage capacity of the park and downstream culvert the flood wave from the reservoir would overtop Bethune Way and enter the densely populated town area just beyond the railway viaduct. This scenario would result in significantly greater consequences to the public and infrastructure. It is during such an event that the worst-case incremental effect of a dam break is expected, although the numbers were found to still be smaller than those during a PMF event.

The dam break analysis was run for a range of different flood events and the incremental effect of the dam break on the downstream consequences was calculated. Risk curves were compiled in order to determine the local maximum, i.e. the worst-case incremental numbers (population and property) relating only to the release of the reservoir.

The local maxima were confirmed by this exercise and are summarised in Table 4.4 below. The risk curves are shown in Figure 4.3 to Figure 4.5 below.

Table 4.4: Local maximum downstream consequence numbers determined by considering a range of different dam break events (EA RFM results included for comparison)

Consideration	Local maximum incremental effect of dam failure*	Comment	EA RFM (2016) results (for comparison)
Population at risk	828	Found to be during the 1 in 2,000 annual chance flood event	1008
Likely loss of life	1.05	Found to be during the 1 in 5,000 annual chance flood event	4.84
Cost of 3 rd party property damage	£11.0 M	Found to be during the 1 in 2,000 annual chance flood event	£ 39.0 M
Notes:			
* These numbers were carried forward to the ALARP assessment, to determine whether the reduction in risk is proportionate to the cost of achieving such reduction.			

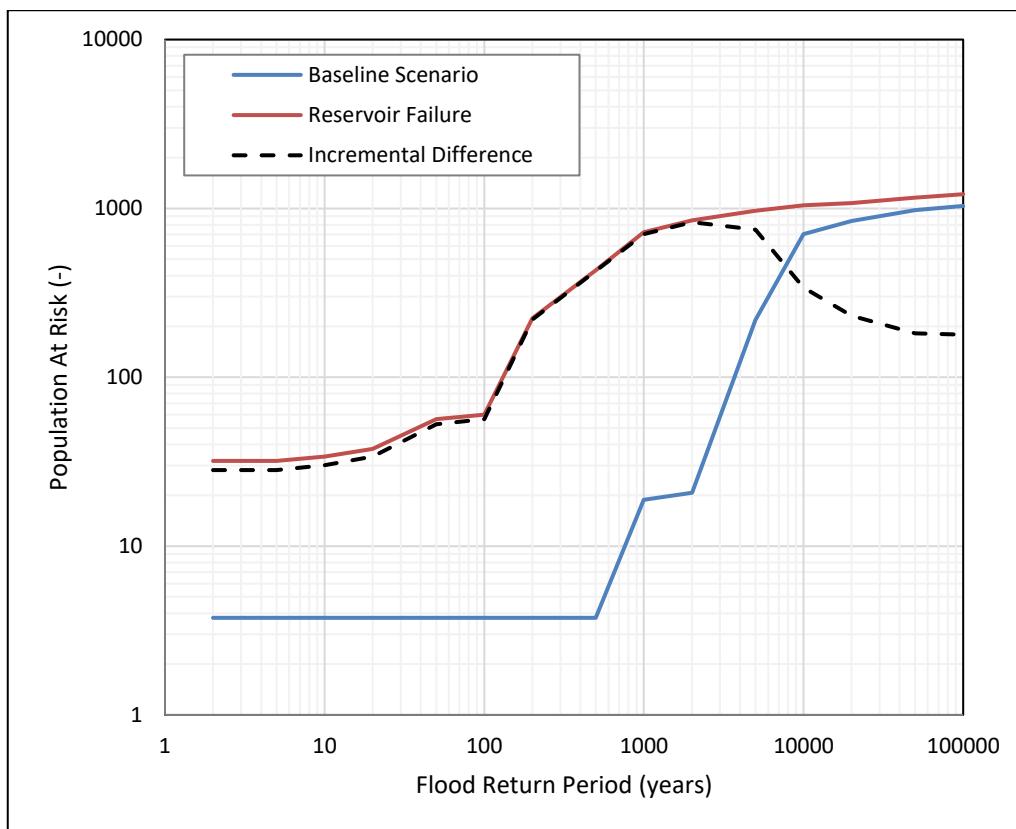


Figure 4.3: The dam break risk curve for population at risk

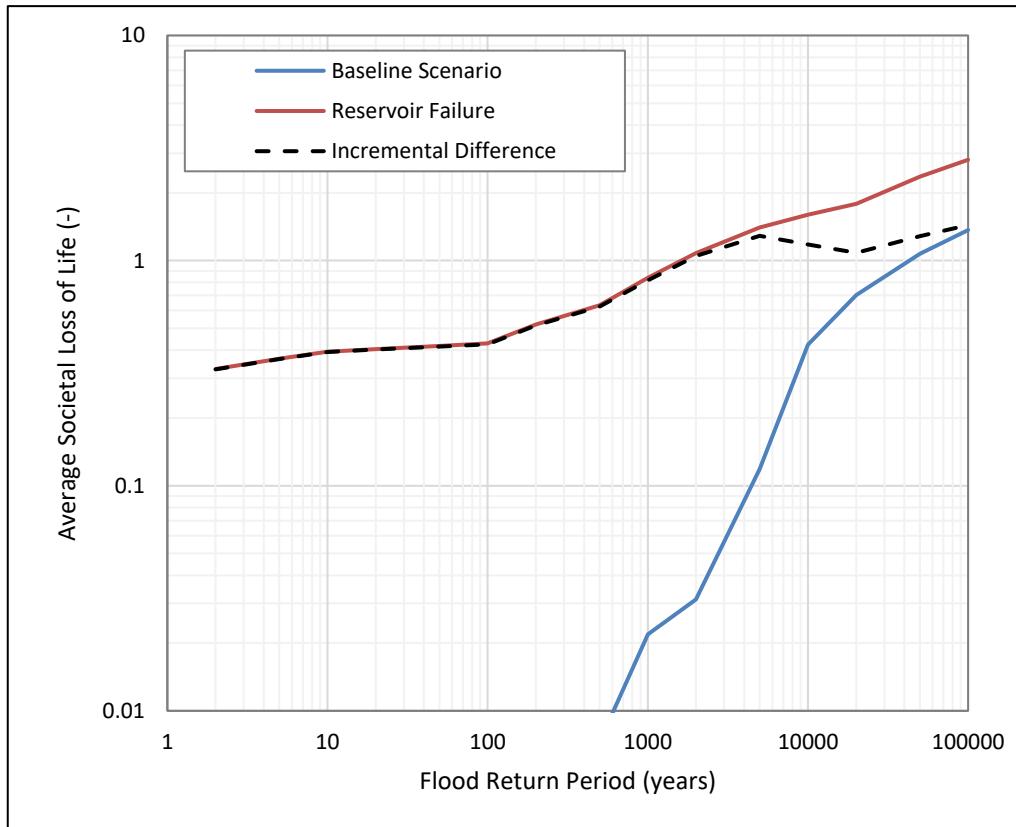


Figure 4.4: The dam break risk curve for average societal loss of life

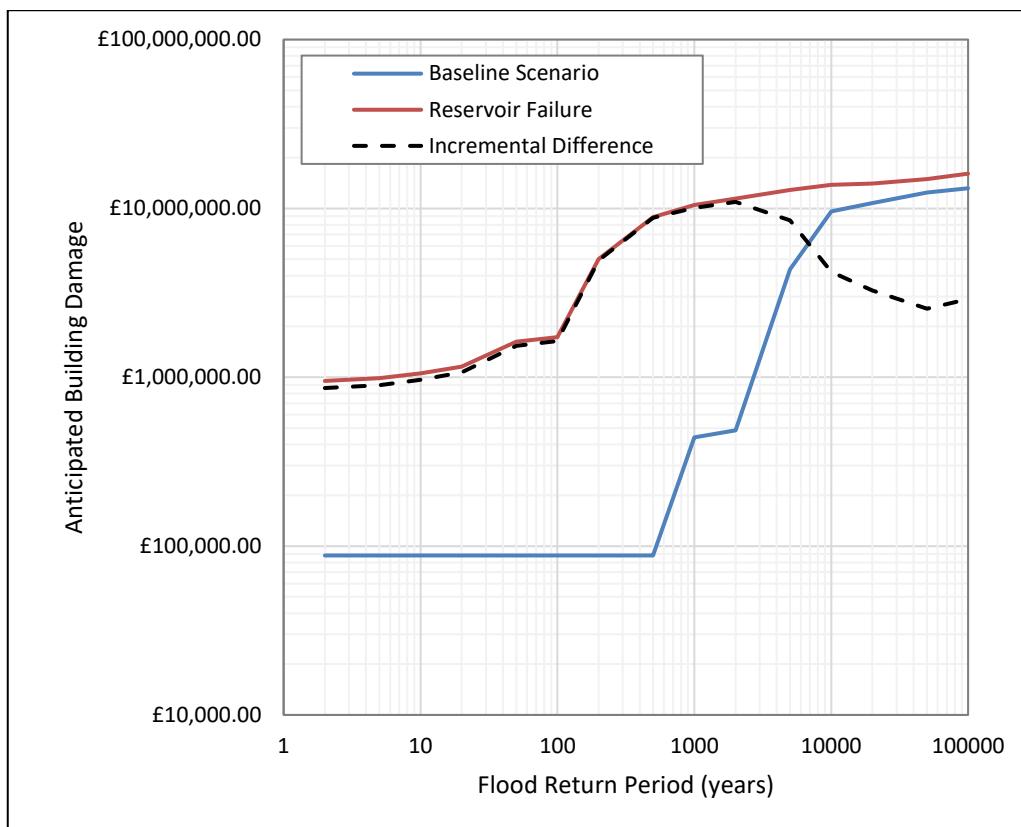


Figure 4.5: The risk curve for anticipated building damages

It should be noted that the local maximum incremental effects of a dam break over and above the existing fluvial flooding, given in Table 4.4 above, were adopted for the purpose of this study.

4.6 Tolerability of Existing Risk to Downstream Property and Communities

4.6.1 General

The subject of what constitutes tolerable risk is complex and many publications discuss this issue and how tolerability of risk should vary between industries and countries. In the UK the current criteria for both individual and societal risk are set out in R2P2 (HSE, 2001) and RARS suggests that these criteria should be applied to reservoirs in the UK. The criteria are shown in Table 4.5 below.

Table 4.5: Criteria for tolerability of risk to human life in the UK as suggested in R2P2 (RARS, 2013)

Type of risk (definition in Glossary)	Boundary suggested in R2P2 (paragraph number in R2P2)	
	Tolerable and unacceptable	Tolerable and the broadly acceptable
Individual risk	For members of the public who have a risk imposed on them 'in the wider interest of society' this limit is judged to be 1 in 10,000 (10^{-4}) (132)	Individual risk of death of one in a million per annum (10^{-6}) (130)
Societal risk	The risk of an accident causing the death of 50 people or more in a single event should be regarded as intolerable if the frequency is estimated to be more than one in five thousand per annum'. (136)	No specific advice. Older publications suggest that it may be two orders of magnitude lower than the boundary for broadly acceptable.

4.6.2 Risk to Individuals

Individual risk can be described as the annual probability of the loss of life of the theoretical individual most exposed to the hazard. Generally, with reservoirs, this would be the risk to people living in the house located within the flooded zone nearest the dam where the force of the dam failure flood would be most severe and where warning would be least effective.

The HSE provides guidance on the acceptability of risks to individuals, as summarised below:

"HSE believes that an individual risk of death of one in a million per annum for both workers and the public corresponds to a very low level of risk and should be used as a guideline for the boundary between the broadly acceptable and tolerable regions" (R2P2 para 130) (HSE 2001). This suggests that a risk of 1×10^{-6} per annum or lower is acceptable.

The HSE limit of intolerance is 1 in 10,000 (1×10^{-4} per annum) for members of the public who have a risk imposed on them 'in the wider interest of society' (R2P2 para 132). It has therefore been argued that this limit for intolerance should be adopted as long as at least one life is in jeopardy (likely loss of life > 1).

In the case of Buckshole Reservoir, the risk of loss of life per year to the most exposed individual (those living in the house nearest the dam) due to a dam failure is shown in Table 4.6 below. This is calculated as the product of the probability of failure and the probability of loss of life given the dam fails. This represents the worst fatality rate, just downstream of the dam where the flood wave will have the greatest impact. The results of the assessment indicate that probability for Buckshole Reservoir is more likely than 1 in 10,000 per annum which is unacceptable.

Table 4.6: Risk outputs related to individual vulnerability due to a dam break during floods

Consideration	Value	Comment	Tolerability
Overall probability of failure of the dam	2.6×10^{-3}	Previously determined (see section 3.3 above)	-
Individual risk of death per year	2.8×10^{-4} (1 in 3,600)	Annual probability – product of the probability of failure and probability of loss of life given the dam fails This is more likely than 1 in 10,000 prescribed by the HSE (2001)	Unacceptable Indicates that spillway channel must be improved to reduce risk of dam failure to an acceptable level

4.6.3 Cumulative (Societal) Risk

In addition to the individual risk, HSE have also suggested that a different consideration should be made to address "societal risk" where many lives would be lost in a single incident. Societal risk therefore deals with the risk to the entire population, properties and infrastructure downstream exposed to the hazard.

The societal life loss per year due to a dam break during floods is shown in Table 4.7 below. This is calculated as the product of the probability of failure and the likely loss of life given that the dam had failed.

Table 4.7: Risk outputs related to societal life loss due to a dam break during floods

Consideration	Value	Comment	Tolerability
Overall probability of failure of the dam	2.6×10^{-3}	Previously determined (see section 3.3 above)	-
Societal life loss per year	2.7×10^{-3}	Lives per year – product of probability of failure and likely loss of life (see also F-N chart, Figure 4.6 below)	ALARP Indicates that spillway channel must be improved to reduce risk of dam failure to an acceptable level and that a risk based approach can be used.

An F-N chart relates the number (N) of fatalities (F) resulting from an event to the probability of that event occurring, as described in RARS. Such curves may be used to express societal risk criteria and to describe the safety levels of particular facilities, in this case reservoirs. An F-N chart was produced for Buckhole Reservoir to show the current societal risk (see **Error! Reference source not found.** below).

The F-N chart in **Error! Reference source not found.** below shows that Buckhole Reservoir plots in the ALARP zone in relation to the probability of failure and resulting consequences. Risks that fall in the ALARP zone should be reduced as low as reasonably practicable (see **Appendix B**). If the probability of failure could be reduced to less likely than 1 in 10,000 per year, the dam would then be in the broadly acceptable zone, shown in Figure 4.6 below.

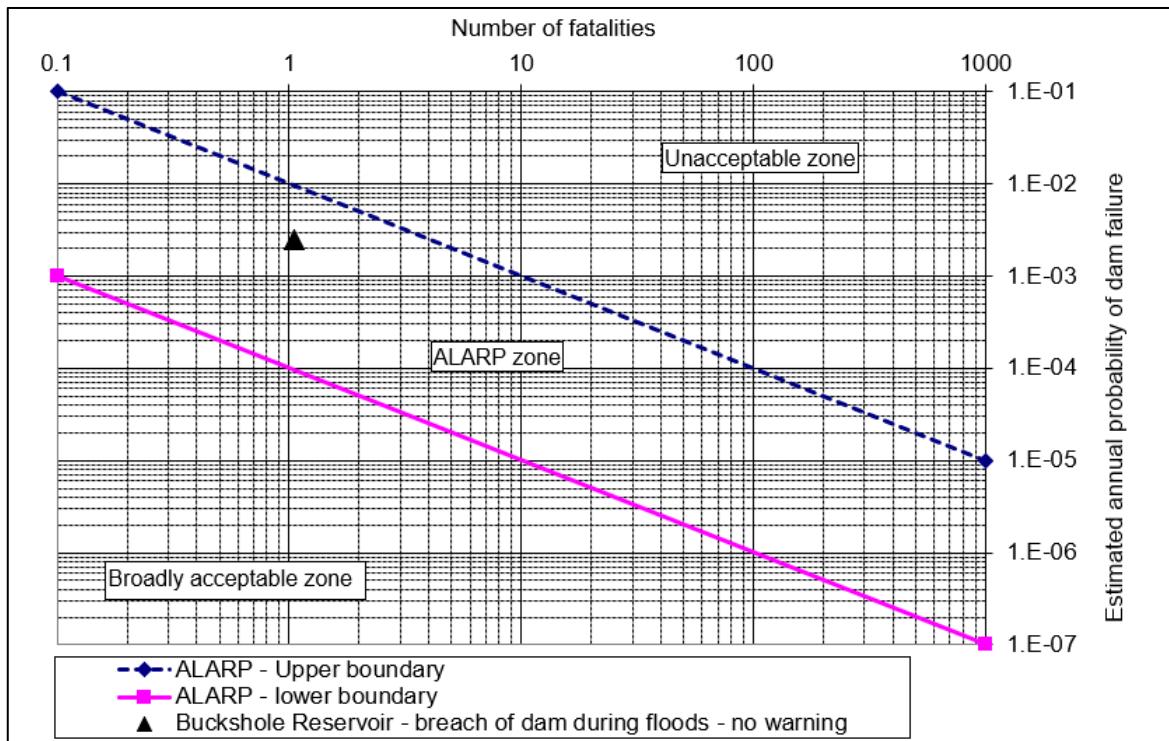


Figure 4.6: F-N chart showing tolerability of societal risk of a dam failure during floods at Buckhole Reservoir

5 Options for Spillway Channel Improvements

5.1 General

This section sets out potential physical options for upgrading the spillway channel capacity, prior to assessing whether the cost is proportionate to the benefits. This section builds on the preliminary list given in Table 5.6 of the Section 10 Inspection Report from 2014. For those options which are considered viable (short-listed options), layout sketches are given in **Appendix F**, with budget cost estimates given in **Appendix G**.

5.2 Long List of Options

Table 5.1 below summarises the long list of all possible options considered as part of this study. These options were assessed at a high level to determine which of them could be carried forward to the short list of options, to be further assessed during the risk-based approach (ALARP). The following factors were taken into consideration during the review of the long-listed options:

- Technical viability;
- Practicality of implementation;
- Anticipated cost of implementation relative to the benefit (risk reduction) achieved; and
- Environmental and landscape impacts.

Four options were deemed to be feasible and likely to provide sufficient reduction in risk to be carried forward to the short list of options. These are discussed further in the sections below.

Table 5.1: Summary of long-listed options

Option ref.	Option description	Pros/Cons	Comments	Option carried forward?
1	A notch can be excavated in the embankment, either to reduce the impounded storage to less than 25,000m ³ or to completely remove any impounded storage. In both these cases the reservoir would be discontinued under the Reservoirs Act 1975 and the spillway upgrade would no longer be mandatory.	Pros: Compliance with Reservoirs Act 1975 no longer required; minimal future maintenance cost. Cons: Major works relating to silt management and reinstating river to its pre-reservoir state; loss of public amenity, likely to be opposed by the public; significant landscape impact; very high cost.	This option was rejected after SWA presented the pros and cons in a workshop to HBC. <i>It is understood that from a political perspective, discontinuance of Buckhole Reservoir would be too risky.</i> Further, this option is anticipated to be expensive and will have a significant effect on the existing landscape and the environment.	No
2	Construct a new enlarged spillway all the way to the downstream toe which maintains the size of the 1985 channel and add covers to contain flow within the channel.	Pros: Full compliance with reservoir safety standards (Floods and Reservoir Safety 4 th Edition). Cons: High cost; maintenance will involve confined spaces entry.	This option is similar to options 3 & 4 in that the original masonry channel is significantly enlarged by replacing it with a rectangular channel which maintains the size of the 1985 channel. In addition to enlarging the channel, this option proposes the addition of covers (possibly steel or concrete) to ensure that flow does not overtop the channel sidewalls in any flood. This option would achieve the full standard as prescribed by Flood and Reservoir Safety 4 th Edition. This option is considered likely to offer a cost effective means of satisfying reservoir safety requirements under an ALARP approach.	Yes
3	Construct an open channel along the footprint of the existing channel which maintains the size of the 1985 channel all the way down to the toe of the dam.	Pros: Significant increase in capacity of channel and significant risk reduction achieved. Cons: High cost; notable landscape impact; risk of flow overtopping side walls during extreme flood event due to super-elevation; does not fully comply with standards-based approach (FRS4).	This option would require the complete demolition of the original trapezoidal channel and partial demolition of the downstream end of the 1985 channel. A new channel will be constructed and will maintain the size of the upstream end of the 1985 channel, i.e. 4m wide by 1.2m high (minimum). This option is considered likely to offer a cost effective means of satisfying reservoir safety requirements under an ALARP approach.	Yes
4	Extend the wider channel section immediately downstream of the 90° bend (which was constructed in 1985) all the way downstream, by cutting into the higher ground to the right.	Pros: Significant increase in capacity of channel; improves hydraulic performance of channel; smaller stilling basin required at downstream end. Cons: High cost; notable to significant landscape impact, especially due to loss of trees; deep excavations required; risk of flow overtopping side walls during extreme flood event due to super-elevation; does not fully comply with standards-based approach (FRS4).	This option would effectively reduce the number of bends in the existing channel by deviating slightly from the footprint of the original channel by cutting into higher ground to the right. The maximum channel section of the 1985 channel will be maintained i.e. 4m wide by 1.2m high (minimum). This option is considered likely to offer a cost effective means of satisfying reservoir safety requirements under an ALARP approach.	Yes

Option ref.	Option description	Pros/Cons	Comments	Option carried forward?
5	Extend the wider channel section immediately downstream of the siphon chamber and eliminate the 90° bend by cutting through the higher ground along the right abutment of the dam.	Pros: Significant increase in capacity of channel; improves hydraulic performance of channel; smaller stilling basin required at downstream end; full compliance with standard-based approach. Cons: Very high cost due to deep excavations and longer length of channel required; significant landscape impact, especially loss of trees and appearance of cutting through the higher ground on right abutment.	This option is anticipated to be very expensive due to the major earthworks required to cut through the higher ground to the right of the dam and the length of channel necessary to return the flow to the watercourse downstream. Further, due to the significant impact on the environment and the existing landscape, this option is likely to be unacceptable from a planning point of view and is therefore rejected .	No
6	Sheet pile along the back of the existing channel wall, continuing all the way to the toe of the dam.	Pros: Adds significant robustness by preventing the upstream progression of scour; although the dam is protected, this option does not prevent damage or failure of existing masonry channel. Cons: Anticipated difficulties with installation; significant landscape impact due to loss of trees on downstream face and appearance of wall itself as it will be required to protrude above the embankment material to compensate for out-of-channel flow.	This option is rejected due to the impracticalities anticipated with the installation procedure and the perceived negative impact on the current landscape and aesthetics relating to the dam and its immediate surrounds.	No
7	Re-construct the original trapezoidal channel with a similar size rectangular reinforced concrete channel and protect the adjacent embankment slope with appropriate erosion protection measures.	Pros: Costs anticipated to be much lower. Cons: Significant adverse landscape impact due to loss of trees and appearance of concrete blocks on a large area of the downstream face; does not fully comply with standards-based approach (FRS4).	This option offers no increase in channel size, but rather increasing the robustness of the channel to ensure that it will not fail at high velocities. Minor benefit by having vertical side walls compared to current raked side walls. Out of channel flow will occur at high floods and erosion of the embankment will be limited by installing appropriate erosion protection measures. This option is considered likely to offer a cost effective means of satisfying reservoir safety requirements under an ALARP approach.	Yes
8	Do nothing to the existing channel and provide erosion protection on the adjacent embankment.	Pros: Lowest cost. Cons: Likely to have significant adverse landscape impact with loss of trees and appearance of concrete blocks on a large area of the downstream face; does not provide sufficient robustness against erosion after failure of the channel side walls.	This option offers no change to the existing channel, and in anticipation of out of channel flow, it is proposed that appropriate surface erosion protection is provided on the downstream face of the dam adjacent to the channel. However, this option does not account for the failure of the channel side walls, which is expected to occur even before the channel capacity is exceeded, leading to erosion of fill material underneath the surface erosion protection. This option is therefore rejected on that basis.	No

5.3 Short List of Options

5.3.1 General

The four short-listed options have been assessed in more detail considering the following factors:

- Technical Viability and Practicality of Implementation;
- Environmental and landscape impacts; and
- Cost.

5.3.2 Provision of Measures for Downstream Energy Dissipation

Energy dissipation at the toe of the channel is a matter of judgement with guidance given in Design of Small Dams (USBR, 1977). The lowest capital cost approach for energy dissipation would be to ensure that the dam is safe (i.e. the reservoir cannot be catastrophically released) but accepting repair costs when scour occurs at the downstream toe of the dam during major flood events. It should be noted that in extreme floods, damage to the watercourse and other structures such as bridges etc. will occur naturally in the flood plain, even if the dam was not present.

It is therefore proposed that the dam be protected by adding some form of energy dissipation within the channel at its downstream end and this approach was followed for all the short-listed options.

5.3.3 Option Refinement – Design Stage and Modelling

Options presented in this report have been developed sufficiently to allow them to be assessed in terms of the risk reduction offered, and compared in terms of cost and their wider merits and disadvantages. The chosen option will require further refinement at detailed design stage. Since the true hydraulic performance of the options would be difficult to predict, in view of the complicated geometries involved, it is strongly recommended that the detailed design of the chosen option is informed using a physical hydraulic model.

5.4 Short List Option 2

5.4.1 General Description

Option 2 involves the demolition of the entire original masonry channel all the way to the central downstream toe, a length of approximately 40m, and the demolition of the reduced downstream section of the 1985 channel, as shown in Figure 5.1 below. A new reinforced concrete channel will then be constructed maintaining a constant section, approximately 4m wide, all the way to the central downstream toe.

In order to contain the flow during extreme floods, especially the effects of air entrainment and super-elevation around the bends, it is proposed that the channel be covered along its full length, either by steel panels fixed to the sidewalls or concrete slabs.

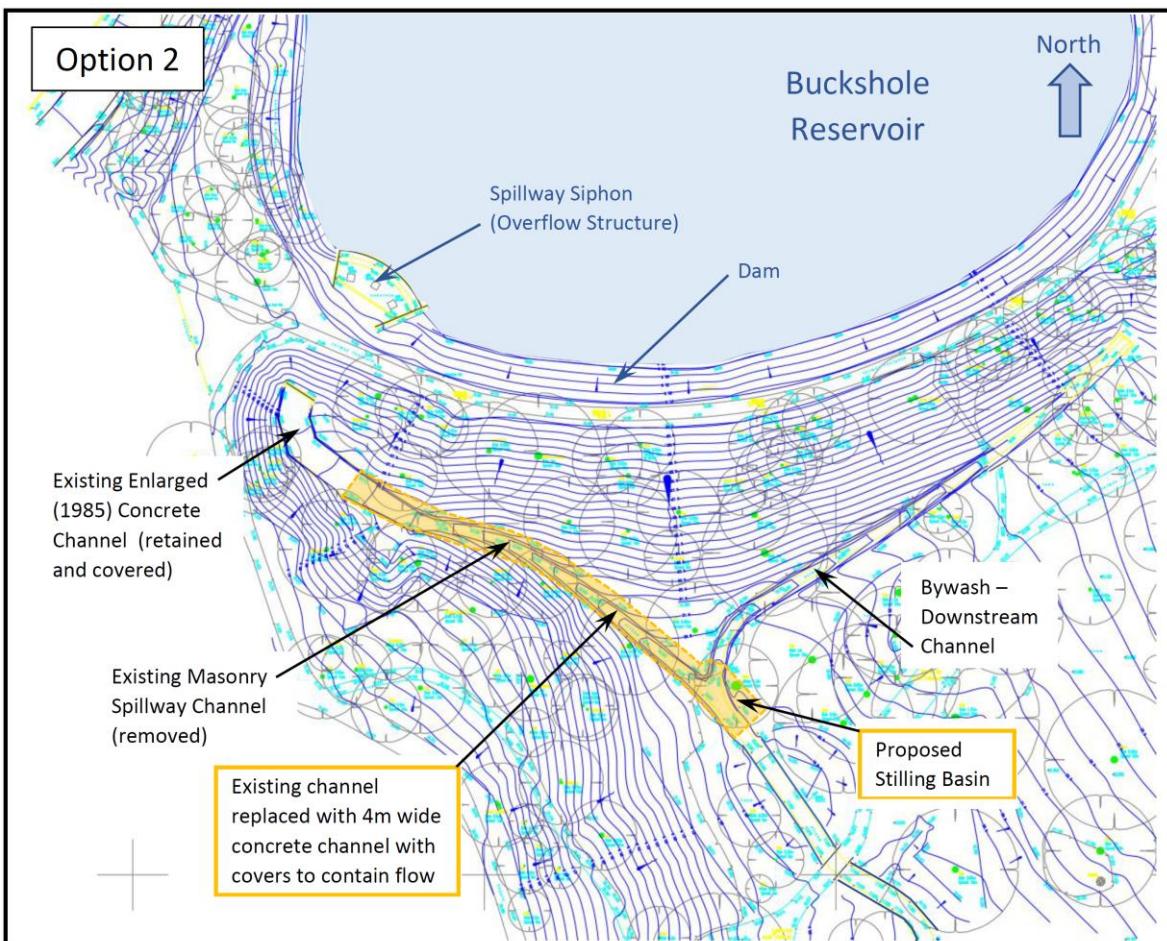


Figure 5.1: Option 2 Proposed New Covered Channel

5.4.2 Technical Viability

The proposed channel was modelled in HEC-RAS 5.0.5 software noting that the effects of flow around the bends are not accounted for. The HEC-RAS model showed that the capacity of the channel will be sufficient to pass all the required floods. Further, any wave action will be contained by the covers, preventing out of channel flow and subsequent erosion of embankment material. This option will ensure compliance with the standards-based approach, which is prescribed in Floods and Reservoir Safety 4th Edition.

5.4.3 Landscape

The most notable landscape impact will be the loss of trees. Although the channel will follow the route of the existing, the footprint will be much larger, resulting in vegetation clearance on both sides of the channel. Figure 5.2 below provides an indication of this. With this option topsoil can be placed on the channel covers allowing the establishment of a grass cover which will help to offset the landscape impacts.



Figure 5.2: Indicative areas of vegetation loss related to an enlarged channel

5.4.4 Ecology

The reservoir and its adjacent habitats are of ecological value and adverse ecological impacts are anticipated if the works are to take place in the absence of mitigation. An ecological assessment will be required to inform the scheme design and planning application. It is anticipated that further desk top assessments and/or on-site surveys will also be required following on from the preliminary appraisal.

5.4.5 Heritage

Alexandra Park is a Grade II listed park, and as such consent will be required from Historic England (HE). Early consultation with HE should be undertaken, although it is anticipated that Option 2 can be designed to minimise impacts in the park such that HE consent can be achieved.

5.4.6 Cost

The high-level cost associated with this option was estimated to be in the order of £900,000. This estimate is based on similar work that Stillwater Associates have been involved with. The cost estimate includes an optimism bias of 50% which is generally considered appropriate for projects at feasibility stage. A more detailed cost estimate can be produced during the detailed design.

5.5 Short List Option 3

5.5.1 General Description

Option 3 involves the construction of a larger channel extending all the way to the downstream toe similar to Option 2 above, but with no covers. The resulting 4m wide open channel will maintain the size of the 1985 spillway channel along the full length of the chute.

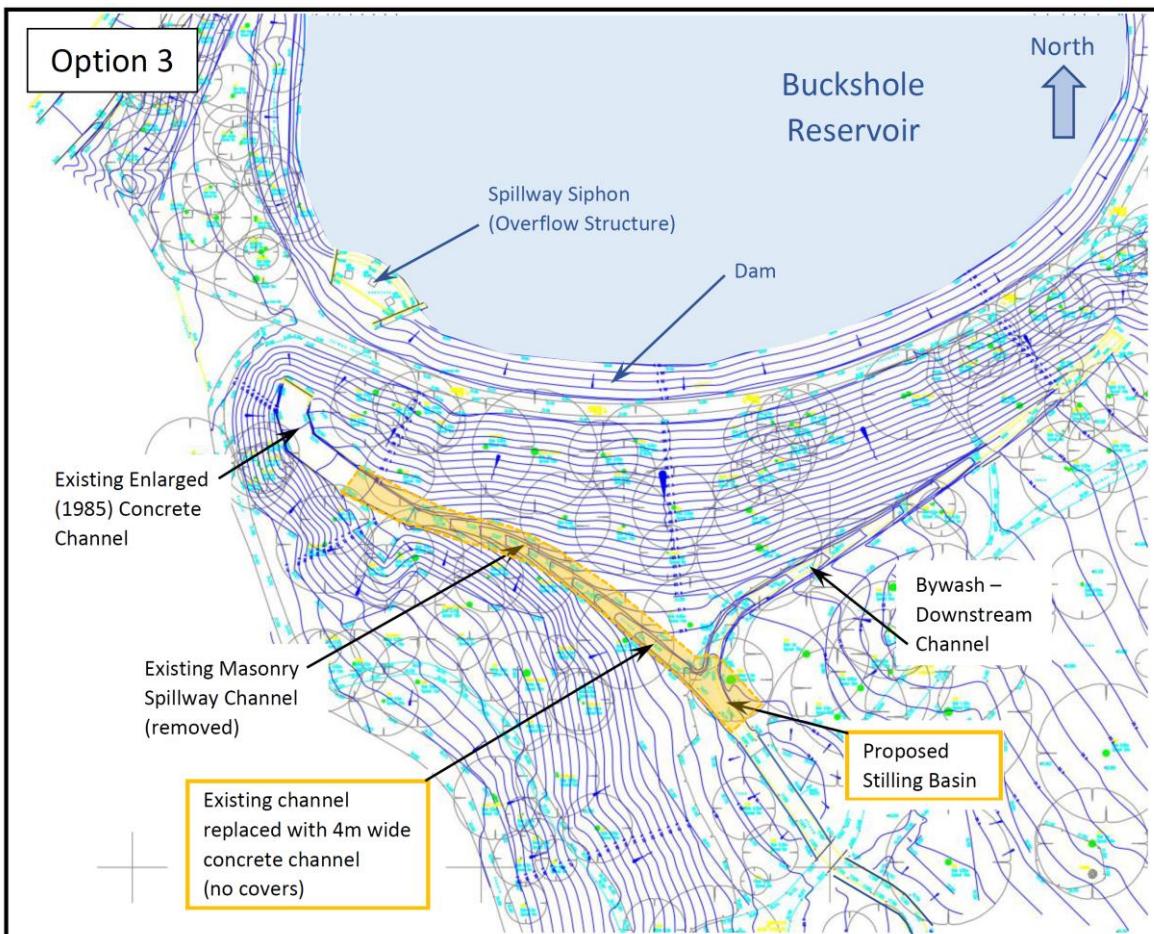


Figure 5.3: Option 3 Proposed New Spillway Channel (no covers)

5.5.2 Technical Viability

The proposed channel was modelled in HEC-RAS 5.0.5 software noting that the effects of flow around the bends are not accounted for. The HEC-RAS model showed that the capacity of the channel will be sufficient to pass all the required floods.

However, the critical section of the channel remains at the first, existing 90° bend. This section was checked for the effects of air entrainment and super-elevation, and it was found that the capacity of the channel here would be in the order of 30m³/s which is only marginally smaller than the current Design Flood outflow of 31.4m³/s.

It should be noted that the effect of flow around the bends can only be accurately predicted by using computational fluid dynamics (CFD) or a physical model, both of which should be considered during the detailed design stage. As part of a physical model exercise it would be possible to incorporate simple features, such as training walls within the channel, or 'bus-shelter' deflectors on the channel walls, to help minimise out of bank flows and thus optimise this option potentially at a relatively low marginal cost. The cost of physical modelling for Option 3 is included in the option cost estimate used for assessing the option in the ALARP process.

Although a significant reduction in the probability of failure would be achieved, this option would not fully satisfy the standards prescribed in Floods and Reservoir Safety 4th Edition.

5.5.3 Landscape

The landscape impacts are very much similar to Option 2 as the proposed footprint of the channel remains the same. However, with this option the channel would not be covered and the enlarged concrete channel would be visible.

5.5.4 Ecology

As with the other short-listed options adverse ecological impacts are considered inevitable if no mitigation is provided, and further appraisals and surveys will be required to inform the design and planning application.

5.5.5 Heritage

As with the other options early consultation with HE should be undertaken to understand and address potential impacts associated with the Grade II listed status of the park.

5.5.6 Cost

The high-level cost associated with this option was estimated to be in the order of £650,000. It should be noted that this estimate is based on similar work that Stillwater Associates has been involved in. The cost estimate includes an optimism bias of 50% which is generally considered appropriate for projects at feasibility stage, and also includes the cost of a physical modelling exercise to optimise this option. A more detailed cost estimate can be produced during the detailed design.

5.6 Short List Option 4

5.6.1 General Description

Option 4 is similar to Option 3 with the 1985 channel cross-section maintained all the way downstream as an open channel. However, with this option the channel would follow a straight alignment downstream after the initial 90° bend. This alignment would require significant cutting into the high ground to the right of the channel (see **Error! Reference source not found.** below), with associated significant loss of existing trees. Where the original masonry channel is outside the footprint of the new channel it would be backfilled as part of the 'extension' of the embankment fill against the left sidewall of the new channel. The straight channel itself would be easier to construct compared to options with curved alignments, but would require a high retaining wall along part of its length.

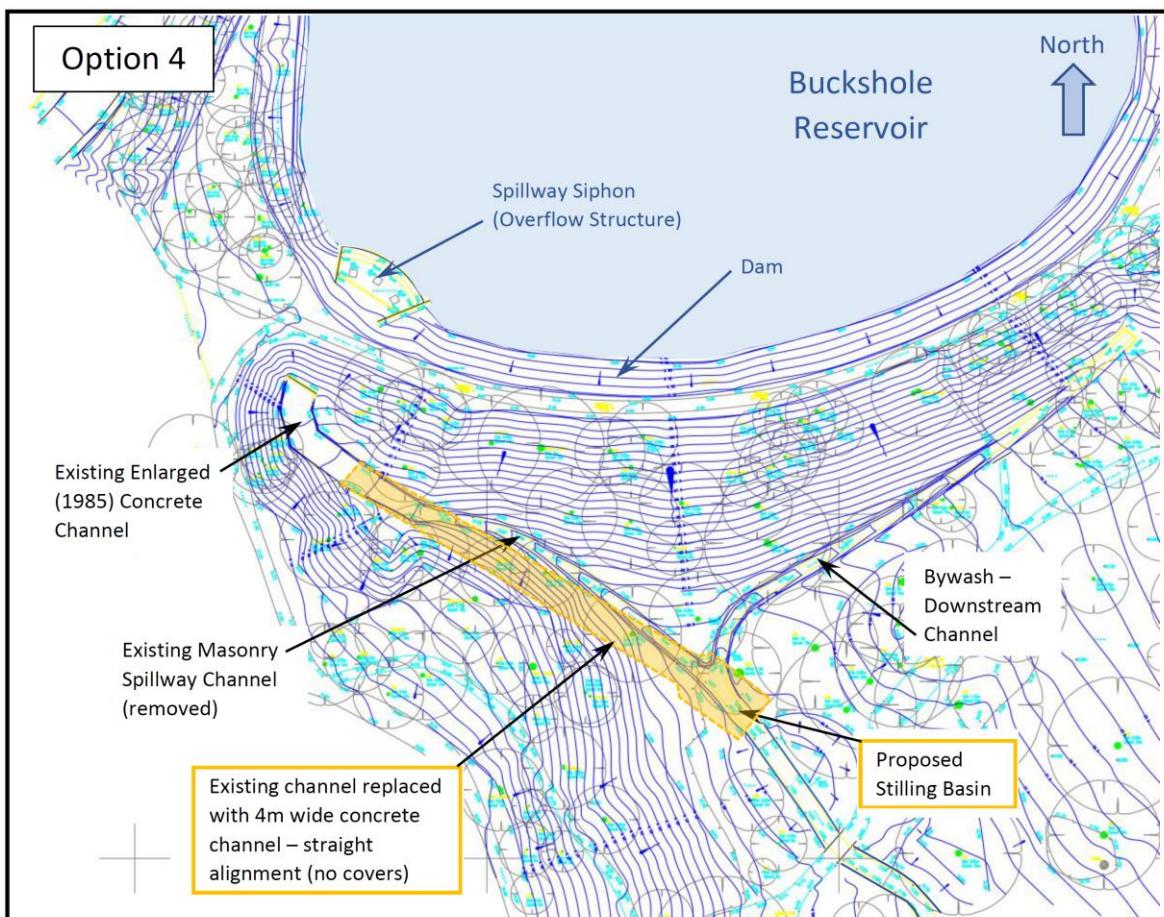


Figure 5.4: Option 4 Proposed New Spillway Channel (straight alignment – no covers)

5.6.2 Technical Viability

The technical viability is similar to Options 2 and 3, with the channel having an estimated capacity in the order of 30m³/s, with the only major restriction in flow being the expected super-elevation of flow caused by the initial 90° bend.

It should be noted that the effect of flow around the bends can only be accurately predicted by using computational fluid dynamics (CFD) or a physical model, which should be considered during the detailed design. As with Option 3 as part of a physical model exercise it would be possible to incorporate simple features, such as training walls within the channel, or ‘bus-shelter’ deflectors on the channel walls, to help minimise out of bank flows and thus optimise this option potentially at a relatively low marginal cost.

Although a significant reduction in the probability of failure would be achieved, this option would not fully satisfy the standards prescribed in Floods and Reservoir Safety 4th Edition.

5.6.3 Landscape

The footprint of the new channel follows a straight line immediately after the initial 90° bend. The most notable landscape impact will be the appearance of the new channel, which will be much larger than the original masonry channel, and thus considerably more imposing, and also the route of the channel cutting into the higher ground along the right mitre of the dam, significantly changing the appearance of this area. Inevitably there will be some loss of trees associated with this option. The old masonry channel will be backfilled, and the toe of the dam will effectively be extended to follow the left sidewall of the new channel.

5.6.4 Ecology

As with the other short-listed options adverse ecological impacts are considered inevitable if no mitigation is provided, and further appraisals and surveys will be required to inform the design and planning application.

5.6.5 Heritage

As with the other options early consultation with HE should be undertaken to understand and address potential impacts associated with the Grade II listed status of the park.

5.6.6 Cost

The high-level cost associated with this option was estimated to be in the order of £750,000. This estimate is based on similar work that Stillwater Associates have been involved in. The cost estimate includes an optimism bias of 50% which is generally considered appropriate for projects at feasibility stage, and also includes the cost of a physical modelling exercise to optimise this option. A more detailed cost estimate can be produced during the detailed design.

5.7 Short List Option 7

5.7.1 General Description

Option 7 is offered as the least cost technically viable option. With this option the existing masonry channel would be replaced within the same footprint, to minimise excavation, using a reinforced concrete structure. The replacement structure would be a similar size, with similar cross-section, but with vertical rather than sloping side walls. The new channel would accommodate normal outflows from the reservoir and the more frequent less severe flood events. It would also be sufficiently robust to significantly reduce the risk of failure of the sidewalls during high flows. However, since the channel is too small to contain the design flows, approximately a quarter of the actual size required, flows exceeding approximately 10m³/s, or the 1 in 500 year flood event, can be expected to flow out of channel on to the face of the dam. These will be high velocity flows and would start to erode the dam. To mitigate this effect the option would include erosion protection on the downstream face of the dam adjacent to the channel in the form of tied concrete blocks. This protection system would be expected to be extensive to accommodate the significant out of channel flows that would occur during the design flood event and, to some extent, the safety check flood event. In both of these scenarios the majority of the flow passing down the spillway would be out of channel.

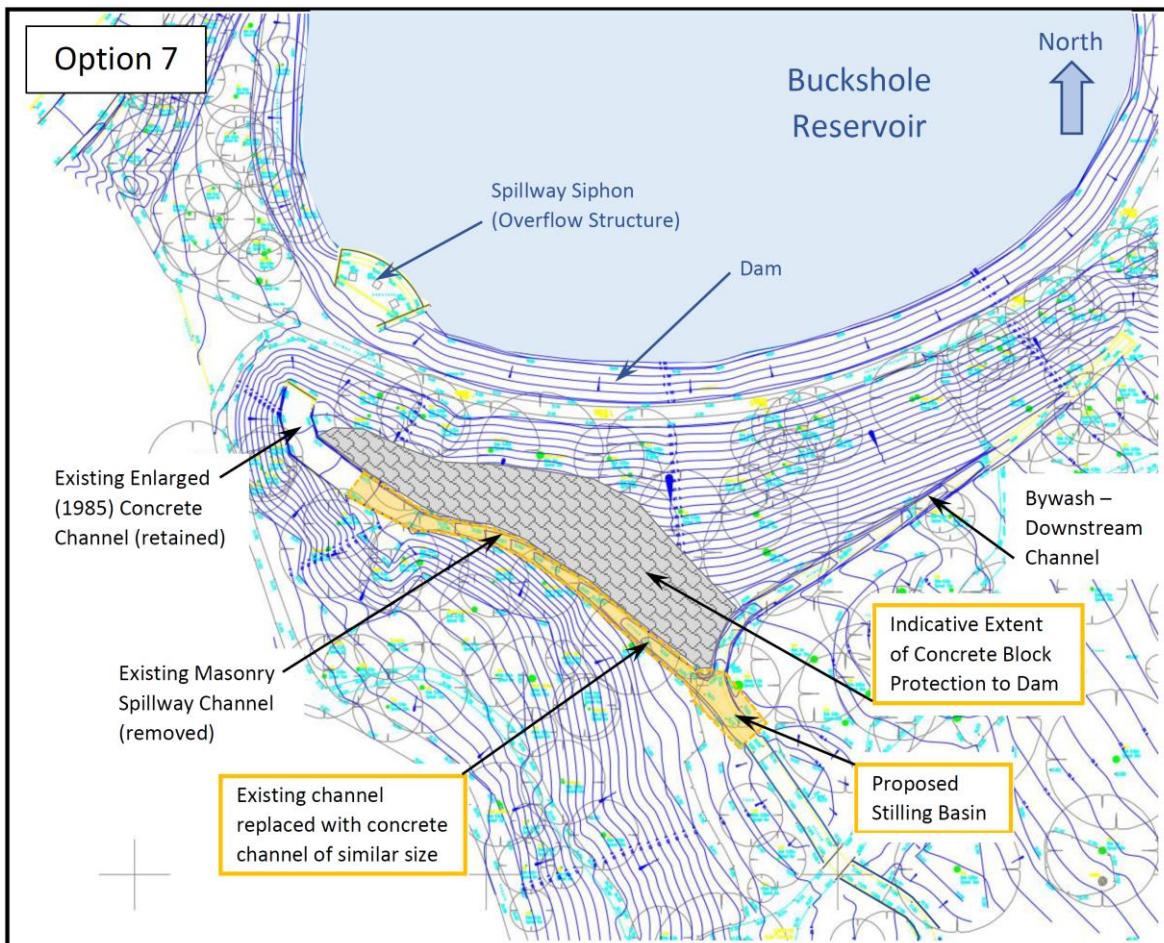


Figure 5.5: Option 7 Proposed New Spillway Channel and Concrete Block Protection to Dam

5.7.2 Technical Viability

The technical viability of this option is slightly more complex than other options and relies mostly on the robustness of the chosen erosion protection system on the downstream face of the dam, rather than on the replacement spillway channel. The velocity and depth of the out of channel flows will determine the type of protection that would be required. CIRIA 116 provides guidance on the design of these protection systems, determined primarily on the velocities and duration of the out of channel flows.

A high-level check of the expected out of bank velocities was carried out for the purpose of this study by using HECRAS 5.0.5 software. It was found that the out of bank velocities would generally be significantly lower than those in the channel, typically in the order of 60 to 80% lower. Although the out of bank flow velocities are expected to be lower, the flow would be turbulent and it is anticipated that a tied concrete block protection system would be required.

A more accurate estimation of the out of channel velocities and turbulence during extreme floods should be allowed for during the detailed design, if this option is adopted.

Although a moderate reduction in the probability of failure would be achieved, this option would not satisfy the standards prescribed in Floods and Reservoir Safety 4th Edition.

5.7.3 Landscape

This option is likely to cause the greatest impact on the landscape, with major tree loss on the dam itself and adjacent to the channel. Another major landscape impact would be the appearance of the surface erosion protection on the downstream face, which is anticipated to comprise concrete blocks over a large area of the dam.

5.7.4 Ecology

As with the other short-listed options adverse ecological impacts are considered inevitable if no mitigation is provided, and further appraisals and surveys will be required to inform the design and planning application.

5.7.5 Heritage

As with the other options early consultation with HE should be undertaken to understand and address potential impacts associated with the Grade II listed status of the park

5.7.6 Cost

The high-level cost associated with this option was estimated to be in the order of £500,000. This estimate is based on similar work that Stillwater Associates have been involved in. The cost estimate includes an optimism bias of 50% which is generally considered appropriate for projects at feasibility stage. A more detailed cost estimate can be produced during the detailed design.

5.8 Short-listed Options: Reduction in Probability of Dam Failure

5.8.1 General

The reduction in probability of failure for each of the options had to be calculated in order to be carried forward to the ALARP assessment which is discussed in Section 6. As each of the short-listed options described above involve the construction of a robust reinforced concrete channel, the sequence of events leading to failure changes slightly from the existing arrangements. It was considered that the following sequence of events would need to occur for each of the options:

- A significant rainfall event occurs in the catchment leading to a rise in the water level causing the spillway to operate with associated flow down the spillway channel.
- Flow within the spillway channel increases such that the capacity of the channel is exceeded, and the side walls are overtopped.
- The resultant out-of-bank flow causes the onset of damage of the surface erosion protection on the downstream face adjacent to the spillway channel.
- The failure of the erosion protection leads to the erosion of the adjacent embankment material.
- Erosion scour progresses upstream and the residual eroded cut slope within the embankment material becomes increasingly unstable for a slip surface that intercepts the upstream edge of the crest.
- The scour progresses sufficiently upstream and the catastrophic failure of the residual cut slope causes a breach in the dam and an uncontrolled release of the reservoir.

5.8.2 Event Tree

An event tree analysis was carried out for each of the options and for each case the probability of failure was determined by adding probabilities related to a range of applicable flood events. The event tree is shown in Figure 5.6 below.

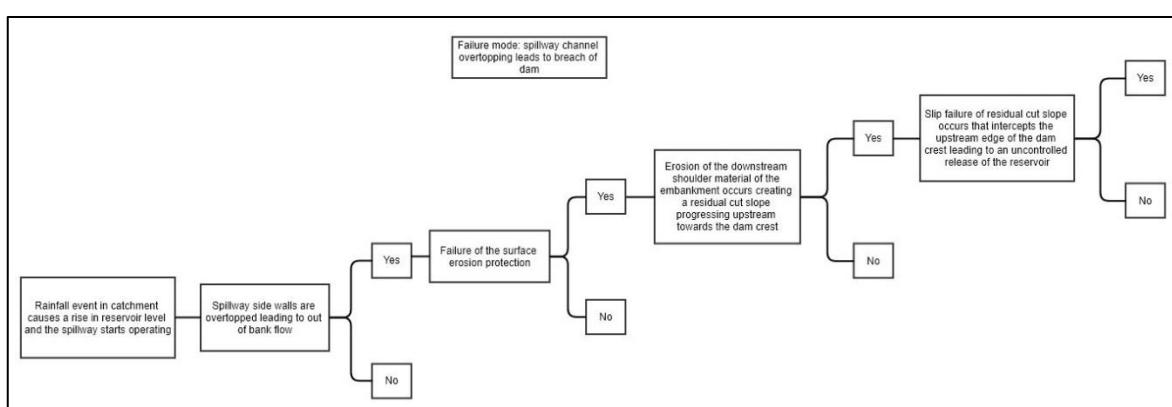


Figure 5.6: The event tree template that lists out the logical steps that would lead to failure for each of the short-listed options

The event tree was further developed for each short-listed option by adding probabilities related to a range of applicable flood events. The fully populated event trees are included in **Appendix H**.

5.8.3 Applicable Flood Events

It should be noted that not all flood events were necessarily included during the calculation of the probability of failure. For each option, the flood events where the flow is expected to be fully contained in the channel, were discarded. This follows from USBR (2010) which states the following:

"Flood load ranges are typically chosen to provide a reasonable breakdown of the flood loads from the maximum flood routed (with the Probable Maximum Flood (PMF) representing the maximum flood that would be considered) to a threshold flood where the spillway discharges are at a level below which failure due to chute wall overtopping is judged to be remote."

5.8.4 Failure of the Surface Erosion Protection on the Downstream Face

The likelihood of such a failure occurring is a matter of judgement. To allow a reasoned estimate to be made of the relationship between the likelihood of surface erosion protection failure (grass and concrete blocks) and velocity of out-of-channel flow two fragility curves were developed. These curves were developed through a collaborative process involving discussions with the QCE and reference to CIRIA Report 116: Design of Reinforced Grass Waterways. The event likelihood descriptors and associated estimated factors that were used to develop the fragility curves were adapted from Mason (2010) and these are given in Table 3.3 above. The fragility curves for grass and concrete blocks are shown below in Figure 5.7 and Figure 5.8, respectively.

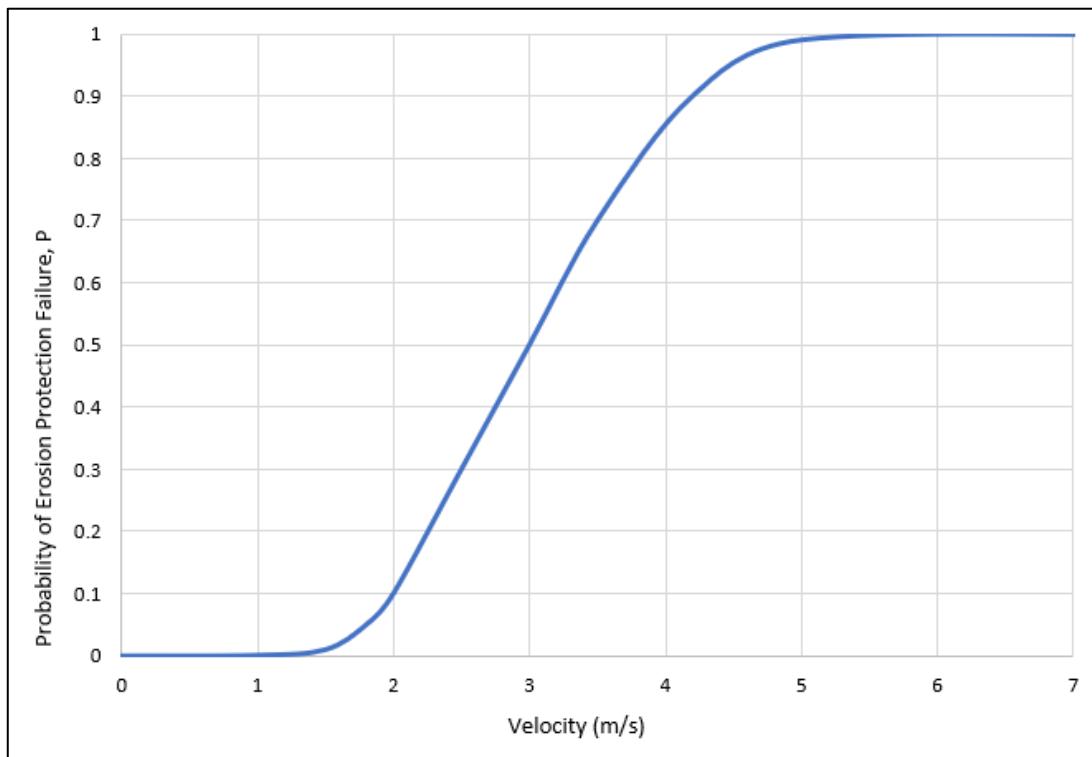


Figure 5.7: Fragility curve produced for good grass protection on the downstream face

In summary, the above fragility curve indicates that there is a 10% probability of failure of the grass protection during flow velocities of around 2m/s, a 50% probability with flow of around 3m/s and a 90% probability with flow of around 4.2m/s.

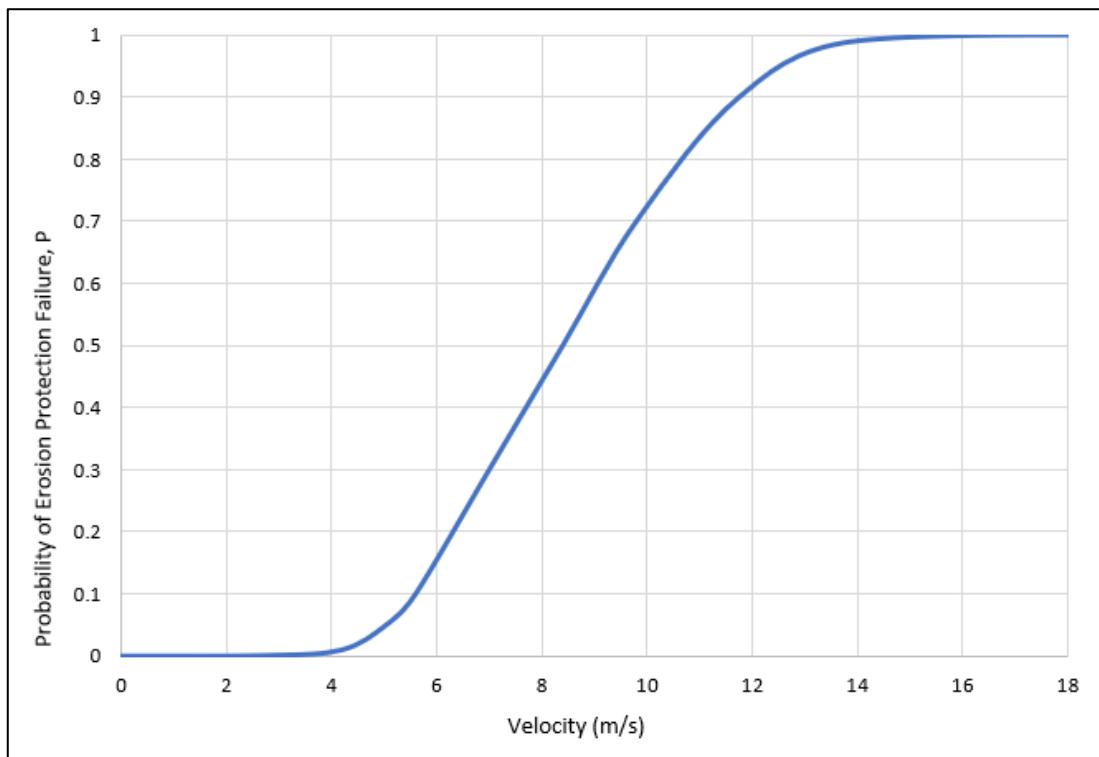


Figure 5.8: Fragility curve produced for interlocking concrete blocks on the downstream face

In summary, the fragility curve indicates that there is a 10% probability of failure of the interlocking concrete blocks during flow velocities of around 5.5m/s, a 50% probability with flow of around 8.5m/s and a 90% probability with flow of around 12m/s.

5.8.5 Probability of Dam Failure

The probability of dam failure under each of the options was calculated using the same approach used for the existing situation, i.e. multiply all the probabilities linked to each step in the event tree and then add the total probabilities for each flood event to determine the overall annual probability of failure. The results are summarised in Table 5.2 below.

Table 5.2: Summary of the annual probability of failure that was calculated for each of the short-listed options

Short-listed option	Option description	Probability of failure after works	Comment
Option 2	Large capacity concrete channel with covers to contain flows	2.5×10^{-6}	Meets the standards-based approach, i.e. full requirements for a category A dam Individual risk of death per year = 3×10^{-7} (Broadly Acceptable) Societal life loss per year = 3×10^{-6} lives p.a. (Broadly Acceptable)
Option 3	Large capacity concrete channel following footprint of existing channel	8.6×10^{-6}	Individual risk of death per year = 1×10^{-6} (Broadly Acceptable) Societal life loss per year = 9×10^{-6} lives p.a. (Broadly Acceptable)
Option 4	Large capacity concrete channel cutting into right abutment downstream of 90° bend	5.1×10^{-6}	Individual risk of death per year = 6×10^{-7} (Broadly Acceptable) Societal life loss per year = 5×10^{-6} lives p.a. (Broadly Acceptable)
Option 7	Replace masonry channel with similar-sized rectangular concrete channel and add erosion protection to the adjacent downstream face of the dam	6.2×10^{-5}	Individual risk of death per year = 7×10^{-6} (Tolerable) Societal life loss per year = 7×10^{-5} lives p.a. (Broadly Acceptable)

5.8.6 Risk Reduction

The risk reductions achieved by each of the short-listed options are shown in Figure 5.9 below.

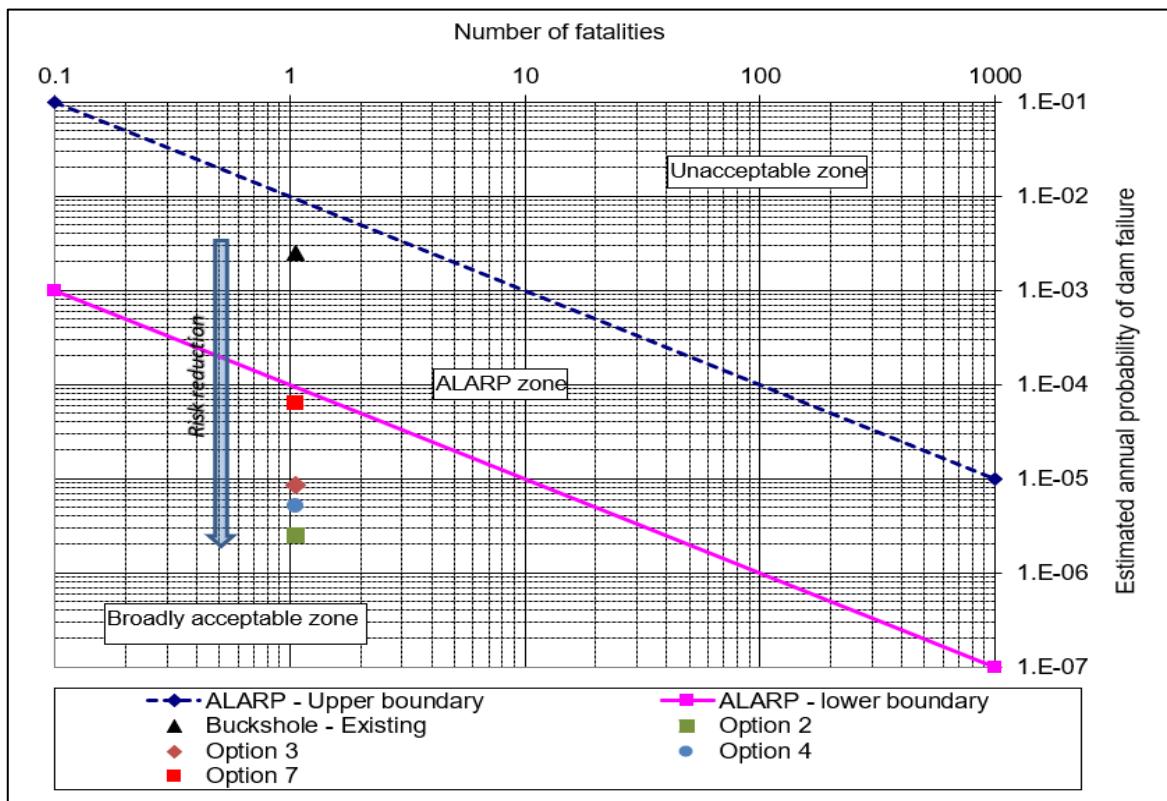


Figure 5.9: F-N chart showing the risk reduction achieved by each of the short-listed options

It is noted that for all options the improvement works reduce the risk into the 'broadly acceptable zone' with Option 2 providing the greatest risk reduction and Option 7 the least.

5.8.7 Residual Risk and 'Future-Proofing'

When considering the relative merits of the options, the extent to which risk is reduced, and the cost of each option, Hastings Borough Council should also give consideration to the residual risk in each case. Whilst all options satisfy the ALARP approach Option 7, for instance, is only marginally within the 'broadly acceptable zone'. A number of factors in the future could affect the risk reduction or the scale of the consequences such that the option no longer falls in the 'broadly acceptable zone'. For instance, increased development downstream in future years could result in a greater value of property and / or a greater population at risk. Alternatively, changes in approaches to hydrology, new data, or climate change could increase flood magnitudes, and increase the risk of dam failure, again resulting in the option no longer falling in the 'broadly acceptable zone'.

It would be prudent to consider options that provide greater protection, and greater risk reduction now and that are less likely to yield to future challenge.

6 ALARP Assessment

6.1 Introduction

This section assesses the costs of the short-listed options and whether these are proportionate to the reduction in risk achieved. The decision on what works should be carried out should be based on the following considerations:

- a) Compliance with engineering standards (discussed in Section 5);
- b) Acceptability of damage to dam (based on acceptance by the QCE);
- c) Economic calculation of costs for each option (Section 5) and their benefit in terms of reduced risk of reservoir failure to the public downstream (Section 5); and
- d) Other considerations, including impacts of each option (discussed in Section 5 and summarised in Section 6.4 below).

The preferred option should then be agreed with the QCE who will ultimately have to sign off the works.

6.2 ALARP Results

This method compares the cost of the short-listed options to reduce risk with the reduction in risk achieved (both cost and risk reduction for each short-listed option are discussed in Section 5). The cost is deemed proportionate (or “as low as reasonably practicable” i.e. ALARP) where the cost to save a life over a 100-year horizon is £8.5M, or less (see **Appendix B** for further information).

The results of this assessment are given in Table 6.1 below. **This shows that the cost of all the options are considered proportionate to the reduction in risk achieved.**

Table 6.1: Summary of costs and benefits for the short-listed options

Option	Works involved	Budget project cost (£k)	Annual PoF	Proportionality factor*	Comment
Existing arrangements			2.6×10^{-3}	-	
2	Large capacity concrete channel with covers to contain flows	900	2.5×10^{-6}	<< 5	Proportionate if proportionality factor < 5 (refer to Section 2.7)
3	Large capacity concrete channel following footprint of existing channel	650	8.6×10^{-6}	<< 5	
4	Large capacity concrete channel cutting into right abutment downstream of 90° bend	750	5.14×10^{-6}	<< 5	
7	Replace masonry channel with similar-sized rectangular concrete channel and add erosion protection to the adjacent downstream face of the dam	500	6.2×10^{-5}	<< 5	
Notes:					
$* \text{Proportionality Factor (PF)} = \frac{\text{Cost to save a life (CSL)}}{\text{Value to prevent fatality (VFF)}}$					

6.3 Sensitivity

As with any analysis there is uncertainty in the various input values and assumptions, which provides uncertainty in the output value. Key uncertainties include the following:

No.	Assumption	Effect on economic case
1	Neglect economic damages	If included, then economic benefits justify the options from a proportionality perspective independent of the loss of life.
2	Use total ASLL, rather than incremental	Could double CSL; although extremely conservative, it could help 'absorb' any future changes in population and properties downstream.
3	Peak flood flows	The current study was carried out using the peak flood outflows that were determined for the purpose of the 1996 Section 10 Inspection Report. These were deemed to be conservative as the rapid method (already conservative) gave much lower numbers. However, it is noted that the numbers might change in the future due to more accurate methods of flood determination and changes in the peak rainfall numbers due to climate change.

In summary, the assumptions made are believed to be conservative, ensuring that they are defendable, if challenged, to support the outcome of the options process.

6.4 Other Considerations

6.4.1 General

Several notable considerations related to the specific options have already been discussed in Section 5, such as landscape, heritage and ecology impacts. Some further general considerations are discussed below.

6.4.2 Risks of Future Dam Safety Works

If the downstream population and properties at risk downstream increase considerably, then there is the risk in future ten yearly Section 10 inspections (safety reviews) that the Panel Engineer may consider that further upgrades are proportionate in cost, and require further increases in spillway capacity (this is mostly likely for Option 7).

A further risk for all options is that in future decades, when climate change is better understood, estimates of the magnitude of the "probable maximum flood" and "1 in 10,000 annual chance flood" may increase, and also lead to the requirement to carry out further spillway upgrades.

6.4.3 Uncertainties in Assessment

There are uncertainties in any estimate of floods, likelihood of failure and consequences of failure. However, it is clear that the dam does not meet the standard for a Category A dam, such that an increase in spillway channel capacity is required.

Even if more detailed analysis of one or more elements of the risk assessment were carried out, this would not likely change the conclusion that spillway upgrading is required.

6.4.4 Future Operation and Maintenance

In general terms the long term future operation and maintenance of the spillway chute under any of the options would be expected to be much as now, although the new structure would need fewer maintenance interventions for a considerable period of time compared with the existing deteriorated structure. A key difference between the replacement spillway chute options in terms of inspections and maintenance is that the covered channel, Option 2, would require confined space entries, whilst the other options, with open channels, would not involve this access constraint. The associated costs would therefore be less for Options 3, 4 and 7.

The drawdown siphon, the preferred option from the 2018 assessment of options for new reservoir drawdown facilities, would require its own operation and maintenance regime. It is anticipated that this would be limited in scope and in any case would be carried out in conjunction with other routine visits using existing resources holding the required skill sets.

The envisaged operation and maintenance requirements for the drawdown siphon and replacement spillway chute works are summarised in Table 6.2 below.

Table 6.2: Summary of operation and maintenance requirements

Drawdown Siphon	
<i>Annual maintenance</i>	
<ul style="list-style-type: none"> • Check system for prime • Six monthly operation of valves to confirm satisfactory operation 	
<i>Long term planned maintenance</i>	
<ul style="list-style-type: none"> • Replace priming equipment and service valves every 20 - 25 years 	
Spillway Improvements	
Option 2: covered chute	Option 3 or 4: open chute
<i>Annual maintenance</i>	
<ul style="list-style-type: none"> • Monthly visual check as far as possible from points of entry • Annual clean and inspection from within channel with reservoir engineer: confined space entry will add cost to this activity 	<ul style="list-style-type: none"> • Monthly visual check from above • Annual clean and inspection from within channel with reservoir engineer: <u>not</u> a confined space
<i>Long term planned maintenance</i>	
<ul style="list-style-type: none"> • Replace joint sealant every 20 years: confined space entry will add cost to this activity 	<ul style="list-style-type: none"> • Replace joint sealant every 20 years: <u>not</u> a confined space

7 Scheme Implementation and Delivery Programme

7.1 Recommendations and Statutory Deadlines

Following a statutory inspection of Buckhole Reservoir under section 10 of the Reservoirs Act 1975 an inspection report was issued, dated 7th April 2017, which included the following recommendations:

Ref	Recommendation in the Interests of Safety	Statutory Deadline	Status/Comment
a	<i>Obtain dambreak maps and consequence assessment from the Environment Agency when they have been updated to 2016 “reservoir flood map specification”, to quantify the incremental consequences if the dam failed in a major flood.</i>	7 th April 2019	Completed 4 th September 2019
b	<i>The output from the above should then be considered by a Panel AR Engineer, and if appropriate an ALARP study undertaken of measures to increase spillway chute capacity, followed by implementation of measures which are proportionate in cost relative to the reduction in risk achieved.</i>	Study by 7 th April 2020 Works completed on site by 7 th April 2022	ALARP study complete (this report). Planning application, detailed design and implementation to follow.
c	<i>Scour capacity is provided to meet the criteria set out in Section 5.8, independent of the drawoff works in the tower which are not readily accessible in adverse weather.</i>	7 th April 2020	Options study completed in 2018. Planning application, detailed design and implementation to follow in conjunction with item (b).
d	<i>A vegetation management plan be prepared.</i>	7 th April 2018	Completed 4 th May 2018

7.2 Implementation Approach and Timing of Works

It is noted that there is a potential disconnect between the two on-site elements of work, in terms of timescales. This has been discussed with Hastings Borough Council and it is agreed that it would be more desirable to undertake the spillway channel improvement works in conjunction with the drawdown upgrade works.

These are matters for the appointed QCE, who ultimately certifies completion of the recommendations, to discuss with the Environment Agency. This has been done, and on the basis that the Council can continue to demonstrate an ongoing commitment, with documented and reported progress towards completing the recommendations in a timely manner, completing the combined works by April 2022 has been agreed with the enforcement authority, the Environment Agency.

In the light of the recent Toddbrook Dam incident in the Midlands the Council will need to remain mindful of the potential reputational implications of missing future deadlines.

Currently it is understood that the April 2022 deadline is still the Council's target for completing all works to address the outstanding recommendations (b) and (c), in line with the statutory deadline for item (b). It has been confirmed by the QCE that this approach is acceptable.

It is anticipated that constructing the siphon drawdown works and the spillway improvement works in combination, under a single contract with the same contractor should yield the following benefits, with an estimated out-turn cost saving of £50,000:

- Cost and time savings with a single design package and a single planning process;
- Internal cost and time savings with a single procurement process;
- Lower out-turn implementation cost and overall shorter programme with savings in overhead costs: mobilisation, site set-up, management and staffing;
- Less overall disruption in terms of construction access and deliveries to site and reduced impact on the public use of the park.

7.3 Programme

Once the option choices are confirmed the next step, in parallel with the Council's internal financial procedures, will be to prepare planning details and submit an application for permission.

It is anticipated that the planning application will require further landscape and ecology assessments or surveys. Assuming these assessments and surveys do not raise any significant issues it should be possible to achieve a planning permission by the end of 2020. This would allow enabling works, in the form of tree felling and vegetation removal to be completed early in 2021 so that the works can be implemented during the spring/summer of 2021 to satisfy the April 2022 deadline.

An indicative programme is given below.



The following is suggested as an indication of the phasing of costs for Draw-down Option 1 (2018 study) and Spillway Channel Option 3 (this study) implemented in combination:

Year 1 [FY 2019/20]	Year 2 [FY 2020/21]	Year 3 [FY 2021/22]
Internal approvals and planning	Surveys, investigations, physical modelling, design and tender	Implementation
£50k	£150k	£550k

8 Conclusions & Recommendations

8.1 General

Following a statutory inspection of Buckhole Reservoir under section 10 of the Reservoirs Act 1975 an inspection report was issued, dated 7th April 2017, which included the following recommendations:

- a) *Obtain dambreak maps and consequence assessment from the Environment Agency when they have been updated to 2016 “reservoir flood map specification”, to quantify the incremental consequences if the dam failed in a major flood;*
- b) *The output from the above should then be considered by a Panel AR Engineer, and if appropriate an ALARP study undertaken of measures to increase spillway chute capacity, followed by implementation of measures which are proportionate in cost relative to the reduction in risk achieved.*

These are mandatory recommendations which must be implemented.

A partial Section 10(6) Certificate was issued on 4th September 2019 to certify that item (a) had been completed.

Stillwater Associates were commissioned by Hastings Borough Council to carry out an ALARP assessment of the existing spillway channel, to address the first part of item (b). As part of this assessment options were developed that would achieve the improvements needed to reduce the risk of dam failure. This report covers the ALARP assessment, identifying a range of practicable options to improve the spillway channel, and provides the information needed for Hastings Borough Council to decide the best course of action to complete recommendation (b).

8.2 Findings of ALARP Study

8.2.1 Annual Probability of Failure

An event tree analysis was carried out to determine the current probability of failure of the dam due to the failure of the existing masonry side walls of the original trapezoidal channel. A collaborative process was followed with early involvement of the Qualified Civil Engineer (QCE), Tom Wanner.

Some useful information on the incident that occurred at Ulley Reservoir in 2007 was also obtained and this was used to inform the current study as the failure mode at Buckhole Reservoir is expected to be very similar to that of the Ulley Reservoir incident, i.e. failure of the masonry side walls and subsequent erosion of the adjacent embankment material. The overall annual probability of failure of Buckhole Reservoir was found to be in the order of 2.6×10^{-3} (roughly 1 in 400 annual chance).

8.2.2 Dam Break Consequence Assessment

An updated dam break analysis was carried out by CC Hydrodynamics for the purpose of this study in order to verify the numbers that were obtained by the Environment Agency (Reservoir Flood Mapping carried out for Buckhole Reservoir according to the 2016 specification). This produced numbers that differ slightly from the EA ones and taking into consideration the high level of detail, which included looking the consequences of a dam break for a whole range of flood events, it was agreed with the QCE that these numbers would be used for the purpose of the ALARP study. The consequences to the public if Buckhole Reservoir were to fail during a flood have been assessed and resulted in the loss of life of around 1 person and around £11M of property damage would be incurred.

8.2.3 Tolerability of Current Risk

Guidance on the tolerability of the risk is provided by the Health and Safety Executive. The current risk to the public and property downstream due to the presence of Buckhole Reservoir was found to be in the ALARP zone where risks should be reduced to as low as reasonably practicable. The individual risk of death was found to be in the unacceptable zone. *This confirms that works to the spillway channel are required.*

The main results from the risk analysis are summarised below.

Consideration	Value	Comment
Existing annual probability of failure	2.6×10^{-3} (~ 1 in 400 annual chance)	Event tree analysis
Existing annual individual risk of death	2.8×10^{-4} (~ 1 in 3,600 annual chance)	Calculated as the product of the probability of failure of the dam and the probability of death given that the dam had failed. This is more likely than 1 in 10,000 lower limit prescribed by the HSE (2001)
Annual societal life loss	2.7×10^{-3} lives per year	Calculated as the product of the probability of failure of the dam and the likely loss of life. This is shown to be in the ALARP zone when using the limits prescribed by the HSE (2001)

8.2.4 Spillway Channel Improvement Options

A range of practicable options were assessed to determine the amount of risk reduction achieved and whether the costs of implementation are proportionate to the amount of risk reduction achieved. The options were also assessed against a range of other considerations, all which need to form part of the final decision on which option to implement. These other considerations include the practicality of implementation and the anticipated impacts on the existing landscape, ecology and heritage.

The following table (Table 8.1) of short-listed options summarises the key considerations within the overall ALARP assessment of options, indicating how the preferred option has been derived:

Table 8.1: Comparison of Short-listed Options and Assessment Considerations

Consideration	Option 2	Option 3	Option 4	Option 7
Option description	Large capacity concrete channel with covers to contain flows following existing channel footprint	Large capacity open concrete spillway channel following existing channel footprint	Large capacity open concrete spillway channel with new straight alignment	Open concrete channel replacing original trapezoidal channel with concrete block bank erosion protection.
Outcome of Risk Based Approach (ALARP)	Option shown to be proportionate, satisfying risk based approach	Option shown to be proportionate, satisfying risk based approach	Option shown to be proportionate, satisfying risk based approach	Option shown to be proportionate, satisfying risk based approach
Relative Probability of Failure Following Works	Low Probability of failure ~ 2.5×10^{-6} [1 in 400,000 annual chance]	Medium Probability of failure ~ 8.6×10^{-6} [1 in 116,000 annual chance]	Medium Probability of failure ~ 5.1×10^{-6} [1 in 194,000 annual chance]	High Probability of failure ~ 6.2×10^{-5} [1 in 16,000 annual chance]
Performance Against Reservoir Safety Standards (Standards Based Approach)	Fully complies with reservoir safety standards The covered channel provides full capacity up to the PMF event	Delivers sufficient reservoir safety improvement, with defendable justification for not fully complying with reservoir safety standards Flows expected to overtop channel side walls in the most extreme floods due to turbulent flow around the initial 90° bend and curved sections of channel	Delivers sufficient reservoir safety improvement, with defendable justification for not fully complying with reservoir safety standards Flows expected to overtop channel side walls in the most extreme floods due to turbulent flow around the initial 90° bend	Marginally delivers sufficient reservoir safety improvement. May not be defendable for not complying with reservoir safety standards. Flow expected to overtop the channel sidewalls in floods greater than 1 in 500 year event, with concrete block protection on the downstream face
Landscape and Visual Impact	Low Some loss of trees. Channel could be covered with grass	Medium Some loss of trees and large open concrete channel visible, but less intrusive than Option 4	High Greater loss of trees than Option 3. Large open concrete channel visible, with higher right retaining wall than Option 3	High Extensive tree loss and adverse visual impact of visible concrete blocks
Indicative Ecology Impact	Medium	Medium	Medium	High
Public Safety	Low Chute would be covered; downstream security grille could be added	Medium Open channel chute would be accessible to the public	Medium Open channel chute would be accessible to the public	Medium Open channel chute would be accessible to the public
Maintenance	High Confined spaces entry required	Medium	Medium	Medium
Planning & Consents	Planning permission will be required; further ecology desk top assessments and/or surveys may be required, to be defined and carried out in consultation with the relevant statutory consultees; Alexandra Park is a Grade II listed park, and as such consent will be required from Historic England.			
Future Proofing	Low and Least Risk Satisfies current standards (standards based approach) and unlikely to require further upgrade works in the future	Low Risk Provides a significant reduction of risk at a proportionate cost: low likelihood of further upgrade works being required	Low Risk Provides a significant reduction of risk at a proportionate cost: low likelihood of further upgrade works being required	High Risk Only marginally satisfies the risk-based approach: significant risk of further upgrades required in the future
Estimated Project Cost [Indicative Maintenance Cost]	£900k [Medium maintenance cost due to safety requirements]	£650k [Low maintenance cost]	£750k [Low maintenance cost]	£500k [Low maintenance cost]

8.3 Recommendations

In principle all of the short-listed options meet the requirements of the Reservoirs Act 1975, as summarised in Table 8.1 above. In every case the risk reduction achieved by the options was shown to be proportionate to the cost of implementation (ALARP was achieved).

In view of the full range of considerations forming the ALARP assessment of options it is recommended that Option 3 is adopted. This option delivers a significant improvement in terms of reservoir safety, reducing the probability of dam failure to an acceptable level, and is anticipated to have a relatively low adverse impact in terms of landscape and ecology. Option 3 also presents no new hazards in respect of public safety, and could be designed with features that reduce the current risks associated with the existing spillway, and offers the lowest cost in terms of future maintenance.

It is important to note that the hydraulic operation associated with the proposed channel under Option 3 would be complex, with waves formed as a result of the sinuous form of the channel that would be expected to wash out of channel during extreme flood events. **It is therefore strongly recommended that a physical hydraulic model is developed to optimise the detailed design of Option 3.** This should allow targeted improvements to be made in the performance of the channel, for instance with the addition of training walls on bends, which would further reduce, or even prevent out of channel flows, minimising the risk of damage to the dam during extreme flood events, thus further reducing the risk of dam failure.

The estimated out-turn cost for Option 3 is £650,000 (exc. VAT).

Strictly, under the risk based approach, the selection of what is “reasonably practicable” would be to construct as close to the engineering standard as possible, unless compelling evidence is provided which shows that this is not “reasonably practicable”. The options appraisal process, under the risk based approach, has demonstrated that there is an option available to the Council, Option 2, that is both proportionate in terms of cost and satisfies reservoir safety standards for a Category A dam. In other words, in terms of strict accordance with current guidance and standards this option should be adopted at Buckshole Reservoir.

However, it is also recognised that affordability is an important consideration, steering the recommendation towards a less costly option that still achieves a reduction in risk into the broadly acceptable zone, shown in section 5 above, Figure 5.7.

Whilst Option 7 appears to offer the least cost approach that still satisfies the risk based assessment of options this option is likely to raise significant objections in terms of adverse landscape and ecology impacts. This may make it difficult to promote through the planning process. Since this option also only marginally satisfies the risk based approach (see Figure 5.7) the Council would also need to be prepared to carry out further improvement works in the future, possibly as a result of the next section 10 inspection in 2026, if there are changes in hydrological approaches, or with changes in conditions (development) downstream.

Both Options 3 and 4 offer similar reductions in risk, but it should be noted that as well as the higher cost associated with Option 4, compared to Option 3, the adverse visual and landscape impacts associated with Option 4 would also be more significant, with greater tree loss during construction, and a more imposing retaining wall against the right bank above the spillway channel.

The construction of the new spillway channel under Option 3 can be implemented in conjunction with the installation of a new siphon draw-down system, which was the subject of a study carried out in 2018. Completing these works would fully address the recommendations made in the interests of safety in the 2017 section 10 Inspection Report.

The total combined out-turn cost for constructing the new spillway channel (Option 3 from the current study) and the installing the new siphon draw-down facility (Option 1 from the 2018 study) is estimated as £750,000 (exc. VAT). This estimate includes all planning, design and implementation costs. It does not include Hastings Borough Council internal costs.

The deadline for completing these works in accordance with the mandatory recommendations is April 2022. The works will require planning permission, which in turn will require further landscape and ecology assessments or surveys. Assuming these assessments and surveys do not raise any significant issues it should be possible to achieve a planning permission by the end of 2020. This would allow enabling works, in the form of tree felling and vegetation removal to be completed early in 2021 so that the works can be implemented during the spring/summer of 2021 to satisfy the April 2022 deadline.

9 References

- CIRIA 1987 Design of reinforced grass spillways. Report 116. 119pp
- Environment Agency 2013 Guide to Risk Assessment for Reservoir Safety Management (RARS)
- Freer 1992 Recent examples of reinforced grass spillways on embankment dams based on CIRIA Report 116. Water Resources and Reservoir Engineering (eds N M Parr, J A Charles and S Walker). Proceedings of 7th British Dam Society Conference, Stirling, pp 167-174. Thomas Telford, London.
- Gosden, Ambler, Courtnadge 2014 Improving the Overtopping Resistance of Flood Detention Reservoirs. BDS Conf. Belfast pp426-437
- Hanson and Simon 2001 Erodibility of cohesive streambeds in the loess area of the Midwestern USA. Hydrological Processes, 20, 23-38.
- Hinks, Mason, Claydon 2008 Ulley Reservoir and High Velocity Spillway Flows. BDS Conf. Warwick.
- HSE 2001 Reducing Risk Protecting People
- ICE 2015 Floods and Reservoir Safety 4th Ed.
- ICE 2004 Interim Guide to Risk Assessment of Dams.
- Mason 2010 Lorne Dam – Stability Review Based on a QRA, Event Tree Approach. BDS Conf. Glasgow.
- USBR 2018 Best Practices Training Manual: Chapter D-1-Erosion of Rock and Soil

Appendix A Outline Scope & Available Information

A.1 Scope Under Task 1

- Obtain dam break data for each of the two failure scenarios:
 - Wet day fluvial flood with no dam failure;
 - Wet day fluvial flood with dam failure.
- Check flood maps for reasonableness, considering topography, extent of flooding shown for fluvial and surface water flood maps on the internet.
- Check downstream consequences (number of people at risk and likely loss of life for two failure scenarios as above). Consider types of buildings shown as flooded and likely fatality rates. Initially (screen) at street level and if necessary, go to level of individual properties. The incremental consequence is then the difference between the two scenarios.
- Comment on uncertainty and the possible change in the estimated numbers if different assumptions were made or a more detailed analysis was carried out.

It is noted that the latest dam break maps by the Environment Agency produced for Buckhole Reservoir and dated 31st October 2017 have been made available to Stillwater Associates. These include the maximum flood extents for both a wet day and a dry day failure.

A.2 Scope Under Task 2

- Estimate the onset of damage due to scour along sides of chute using the methodology for chute capacity described in RARS Section 8.2.3.
- Estimate the probability of failure of the dam due to spillway channel overtopping failure, based on volume of soil to be eroded.
- Collate all available information on the Ulley Reservoir incident which had a similar failure mode as that which can be expected at Buckhole Reservoir. Where applicable, use the Ulley Reservoir results to inform possible scour rates and failure scenarios at Buckhole Reservoir.
- Summarise the above and provide probability of damage and failure for use in ALARP analysis.

A.3 Scope Under Task 3

- Identify a long list of possible options to reduce the probability of dam failure.
- Screen the long list of options to provide a short list of three viable options.
- For the shortlist options estimate the probability of damage and failure using the same methodology as for Task 2.

A.4 Scope Under Task 4

This final task will draw together the outcomes of the first three tasks and carry out the ALARP risk assessment to identify proportionate measures (the recommended option) for upgrading the spillway and/or protecting the dam from out-of-channel flows.

This is achieved by:

- Estimate project costs for the three shortlisted options, (design, surveys, construction etc).
- Perform cost-benefit calculation: the output gives the cost of preventing a fatality.
- Identify those options that will reduce the risk of failure to “as low as reasonably practicable” (ALARP), which implies that the cost of any further upgrades would be disproportionate to the additional risk reduction achieved.
- Include all findings and make clear recommendations on the proposed way forward for Hastings BC.

A.5 Key Assumptions

- This report will present a single preferred option, which will be fully budget costed. The budget costing in the report will include for future design development, planning, procurement and construction of the preferred option.
- A maximum of three short-listed options will be costed.

A.6 Available Information

Date	Author	Title
7 th April 2017	AJ Brown	Report on an Inspection under Section 10 of the Reservoirs Act 1975
30 th October 2006	IC Carter	Report on an Inspection under Section 10 of the Reservoirs Act 1975
32 nd August 2012	HBC	Results of crest level survey
5 th September 2013	HBC	Results of crest level survey
22 nd June 2016	HBC	Results of crest level survey
12 th July 2017	HBC	Results of crest level survey
19 th April 2018	HBC	Results of crest level survey
27 th November 2007	Acad Mapping Ltd	Bank contour survey
11 th July 2008	HBC	Water depth survey
17 th October 2012	HR Wallingford Ltd	Bathymetric survey
2007 / 2008	HBC	As-built drawings (4 no.) of: <ul style="list-style-type: none"> • typical scour protection detail (Feb 2008); • Filling of existing culvert (Jan 2008); • Fishing platform and access (Feb 2008); • Cross sections of scour protection (Dec 2007).
1986	Watson Hawksley	Record drawings of 1985 siphon spillway (8 no.)
1986	Watson Hawksley	Record drawings of the valve tower (2 no.)
3 rd May 2011	Thorne Civil Engineers	By-pass chamber survey
31 st October 2017	EA	Reservoir Flood Inundation Maps

Appendix B ALARP Criteria

B.1 Cost to prevent a fatality (CPF), and worked example

An ALARP approach calculates the cost to prevent a fatality (CPF), defined in Section 10.3 of the Guide to Risk Assessment for Reservoir safety (RARS) (EA, 2013) and is summarised as follows

$$CPF = \frac{\text{Cost of risk reduction measures – Present Value} (\Delta Pf \times \text{Damage})}{\text{Present value} (\Delta Pf \times \text{Likely Loss of Life (LLOL)})}$$

where ΔPf is the change in annual probability of failure due to the proposed risk reduction works.

At its simplest where the CPF is less than the “value of preventing a fatality” (VPF) then the candidate works would be proportionate risk reduction measures; whilst where CPF exceeds VPF then the cost is disproportionate.

Costs should be estimated realistically; it is noted that it is recommended (Defra, 2003) that at prefeasibility stage an optimism bias of 60% is added to the best estimate of total cost, based on experience of total project outturn costs against the prefeasibility estimate. RARS notes in section 10.3 that using Treasury discount rates, the present value of recurring costs over a 100-year period is 30 times the annual value.

For the input values set out below the ALARP calculation equates to:-

$$CSL = \frac{\text{£300,000} - 30 \times (5E-5 - 5E-6) \times \text{£35,000,000}}{30 \times (5E-5 - 5E-6) \times 32} = \frac{300,000 - 47,250}{0.0432} = \text{£5.9M}$$

Input values into above ALARP calculation

Parameter	Value
Cost of candidate works	£300,000
Present value	30 x annual value
Probability of failure - current	=1/20,000 = 5E-5
Probability of failure – after works	= 0.1 times above = 5E-6
Impact of failure: likely loss of life	32 lives
Impact of failure: economic damage	£35M

B.2 Value of preventing a fatality (VPF)

The value that should be assigned to VPF is a difficult decision and includes consideration of

- Direct costs (measurable) such as the earning potential of the victims, injury and long-term health impairment of other victims not included in the LLOL value, and emergency services costs
- Indirect (business losses)
- Intangibles (psychological impact on people, environmental damage) – it could be argued that a value should be assigned to the Intrinsic Value of a Human Life (irrespective of age, health, education etc)

The Department of Transport publishes their assessed VPF for road and rail schemes on the internet, being updated for inflation, with the 2010 value being £1.7M (see RARS)

B.3 Gross Disproportion

However, HSE (2002a, para 25) notes that “gross” disproportion is required before ALARP is satisfied and defines a

$$\text{Proportion Factor (PF)} = \frac{\text{Cost to Prevent a Fatality (CPF)}}{\text{Value to Prevent a Fatality (VPF)}}$$

The purpose of a PF “grossly” greater than unity is to allow for the imprecision of estimates of costs and benefits and also to ensure that the duty holder robustly satisfies the ALARP principle.

HSE guidance on what constitutes a reasonable proportion factor is given in Table A.1.

For dams, where the risk to those in the potential inundation area is involuntary (in that the public are not generally aware of the risk from dams) it will be assumed that the PF should exceed 5 (i.e. product of "VPF and Proportion Factor") before the cost is considered disproportionate. Thus, where CSL is less than $5 \times £1.7M = £8.5M$ it is considered proportionate to carry out the works.

Table A.1: HSE ALARP Suite (Expert Guidance) on proportion factor

No.	Updated	Title	Extracts from HSE Guidance
1	2001	Principles and guidelines	<p>26. Although there is no authoritative case law which considers the question, we believe it is right that the greater the risk: the higher the proportion may be before being considered 'gross'. But the disproportion must always be gross.</p> <p>27. HSE has not formulated an algorithm which can be used to determine the proportion factor for a given level of risk. The extent of the bias must be argued in the light of all the circumstances. It may be possible to come to a view in particular circumstances by examining what factor has been applied in comparable circumstances elsewhere to that kind of hazard or in that particular industry.</p>
2	2003	Assessing compliance with the law in individual cases and the use of good practice	
3	2003	Policy and guidance	
4	n/a	HSE principles for Cost Benefit Analysis (CBA) in support of ALARP decisions	<ul style="list-style-type: none"> ○ Rules of thumb adopted by D/Ds; ○ NSD takes as its starting point the HSE submission to the 1987 Sizewell B Inquiry that a factor of up to 3 (i.e., costs three times larger than benefits) would apply for risks to workers; for low risks to members of the public a factor of 2, for high risks a factor of 10; ○ HID uses similar rules of thumb;
5		Cost Benefit Analysis (CBA) checklist	DFs that may be considered gross vary from upwards of 1 depending on a number of factors including the magnitude of the consequences and the frequency of realising those consequences, i.e. the greater the risk, the greater the DF
6		ALARP "at a glance"	

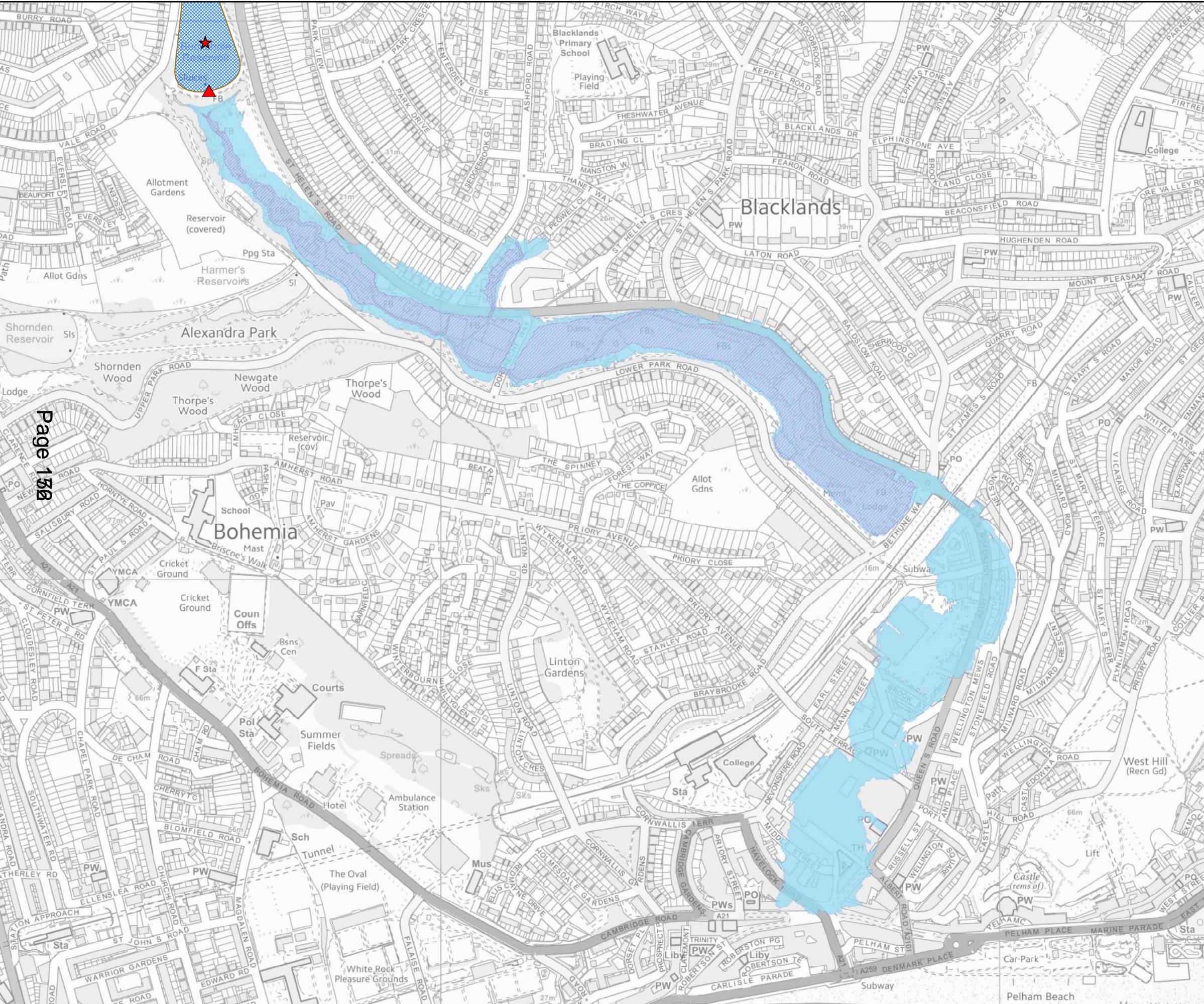
Appendix C EA Reservoir Flood Maps (2016)

OFFICIAL

0 0.05 0.1 0.2 0.3 0.4 Kilometres

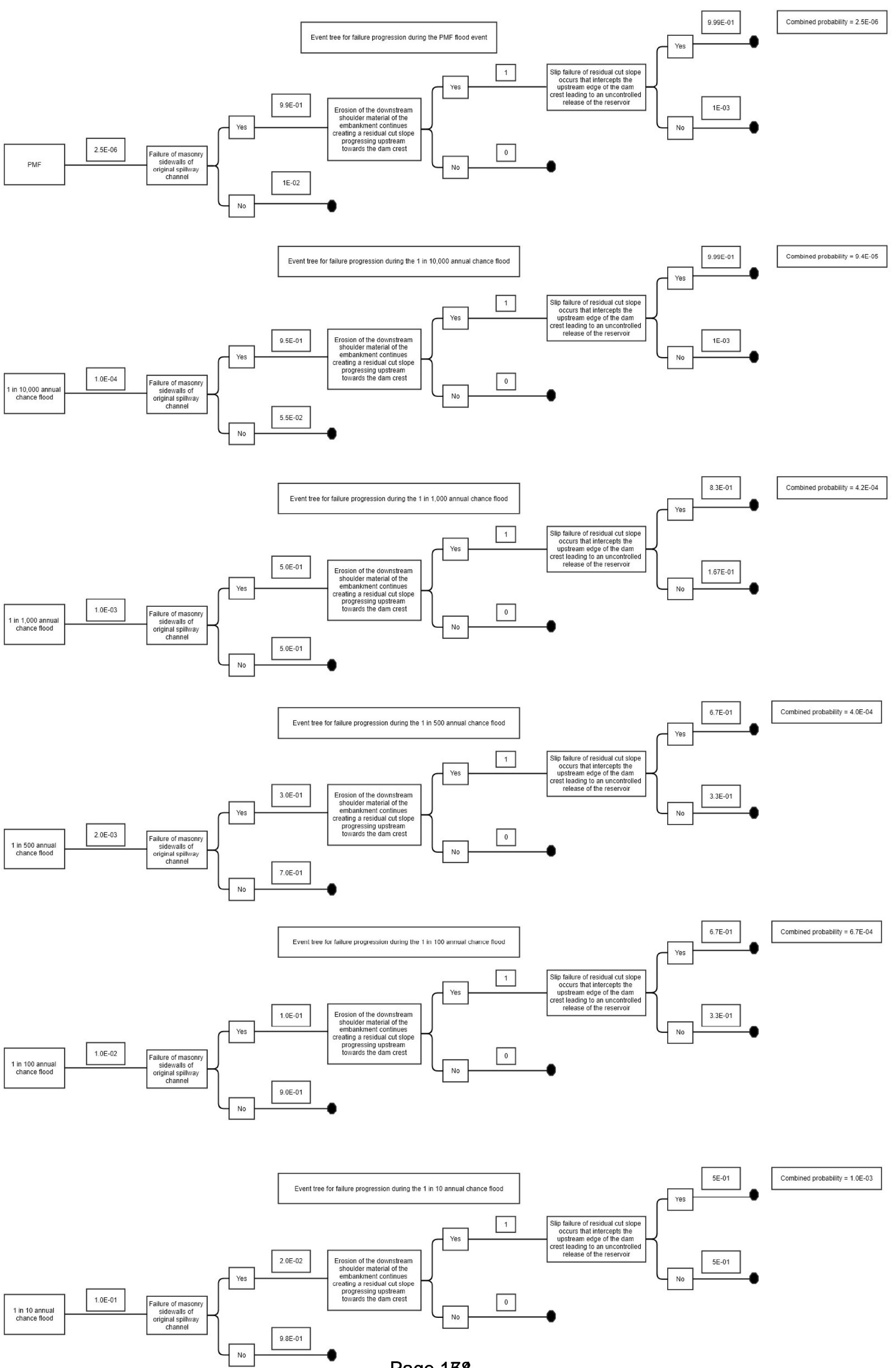


Reservoir Flood Map



Reservoir Name:	Buckhole	Reservoir Case Number:	QP3036BZ															
Map Type:	Maximum Flood Extent Wet Day	Multiple Breach:	1 of 1															
This reservoir flood map is intended to be viewed with its associated flood modelling summary sheet. The summary sheet contains contextual information and assumptions made during modelling that should be taken into account when interpreting the reservoir flood map.			RFM specification version used for map production: Version 1.0.1 July 2016															
			Map Details: For full definition of Dry and Wet Day Scenarios, please see RFM specification (ref given above). Note that not all scenarios are modelled for all breaches.															
Legend: <ul style="list-style-type: none"> ★ Reservoir Location ▲ Breach Location ■ Maximum Fluvial Flood Extent (for comparison) ▨ Flooded Area ▨ Maximum Flood Extent for Wet Day Scenario ▨ Reservoir Extent Marker ▨ Flooded Area 																		
Information Warning: <ol style="list-style-type: none"> 1. We (the Environment Agency) do not promise that the information in this map will always be accurate, complete or up to date or that the information will provide any particular facilities or functions or be suitable for any particular purpose. 2. You, the recipient of the information must ensure that the map meets your needs and are entirely responsible for the consequences of using the map. 3. If an electronic format has been used, we do not promise that the media on which the map is provided will always be free from defects, computer viruses, worms, trojan horses, software locks or other similar code of a destructive or unwelcome nature. You should carry out all necessary checks prior to loading the map on to your computer system. 4. This map is intended to be used by bodies responsible for emergency planning, reservoir risk designation and spatial planning. This map may be used for other purposes where they are both lawful and appropriate. 5. The information contained in this map DOES NOT in any way reflect the structural integrity or likelihood of failure of the dam. 6. This map gives an indication only of the areas that may be flooded if the dam completely failed. The flood extent is best estimate for multi-purpose use. It is based on a simplified modelling approach. Actual reservoir failure may give rise to conditions (flooded areas, flood depth, extent, velocity, hazard, and timing) which vary from those indicated. 7. The data used to create this map were gathered from various independent sources. Defra and the Environment Agency have no control over the quality of the input data from third parties and accept no responsibility for the same. 																		
Permitted Use for Non-Environment Agency Users: <ol style="list-style-type: none"> 1. This map and the information contained within it are protected by intellectual property rights. 2. Whilst you have certain statutory rights which include the right to view and read the map, you are granted no automatic additional use rights whatsoever. 3. However you may optionally agree to the licence contained in our 2009 Standard Notice (non-commercial) (but not in respect of the OS mapping used). If you do not already have a copy of this Licence contact us at enquiries@environment-agency.gov.uk or by telephone on 03708 506506. 4. To activate this licence you do not need to contact us but if you make any use (such as copying by scanning or transmitting it to others) in excess of your statutory rights you are deemed to accept the terms in that Licence. 5. In addition to our standard licence conditions: <ul style="list-style-type: none"> a. you must at all times adhere to the latest version of the National Protocol for the Handling, Transmission and Storage of Reservoir Inundation (Flood) Maps for England and Wales as issued by Defra; b. the limitation of liability in the licence shall also extend to limit any liability of Defra in relation to the map and for this purpose standard condition 12 shall not apply; c. in place of the limitation of liability provisions in the licence you agree that to the extent permitted by law, neither Defra nor the Environment Agency nor their agents shall be liable to a party using this map in contract, tort, negligence, breach of statutory duty or otherwise for any loss, damage, costs or expenses of any nature whatsoever incurred or suffered by that other party whether or a direct nature (whether such losses were foreseeable, foreseeable, known or otherwise) or of an indirect or consequential nature including without limitation any economic loss or other loss of turnover, profits, business or goodwill. 																		
Internal Guidance: <p>This map and the information contained within it remain the property of the Environment Agency. It may not be copied, scanned (or reproduced in any format), or transmitted in any way other than those which are set out in the latest version of the National Protocol for the Handling, Transmission and Storage of Reservoir Inundation (Flood) Maps for England and Wales as issued by Defra.</p>																		
Ordnance Survey Copyright: <p>© Crown copyright and database rights 2017 OS licence number 100024198. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-license, distribute or sell any of this data to third parties in any form.</p>																		
																		
Map Details: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Drawn:</td> <td>JBA Consulting</td> <td>ISC</td> <td>03/07/2017</td> <td>Scale: 1:2,400 at ISO A0</td> </tr> <tr> <td>Checked:</td> <td>JBA Consulting</td> <td>AF</td> <td>22/09/2017</td> <td>Revised: A</td> </tr> <tr> <td>Approved:</td> <td>Supervising Engineer</td> <td>Peter Down</td> <td>31/10/2017</td> <td>Status: Final</td> </tr> </table>				Drawn:	JBA Consulting	ISC	03/07/2017	Scale: 1:2,400 at ISO A0	Checked:	JBA Consulting	AF	22/09/2017	Revised: A	Approved:	Supervising Engineer	Peter Down	31/10/2017	Status: Final
Drawn:	JBA Consulting	ISC	03/07/2017	Scale: 1:2,400 at ISO A0														
Checked:	JBA Consulting	AF	22/09/2017	Revised: A														
Approved:	Supervising Engineer	Peter Down	31/10/2017	Status: Final														

Appendix D Event Tree Analysis for the Existing Spillway Channel



Appendix E Summary Note on Ulley Reservoir Incident

Hastings Borough Council
Buckshole Reservoir: Spillway Channel ALARP Study

Ulley Case Study

Background

Ulley Reservoir is located about 5 km to the south-east of the town of Rotherham in Yorkshire. The dam is a 16m high and 205m long earthfill embankment structure with a puddle clay core. The dam construction was completed in 1873 and was originally used for water supply. More recently it has been used for recreation and amenity only. The reservoir is Category A, where failure of the dam would lead to loss of life and extensive property damage.

Between 24th and 25th June 2007 approximately 92.4mm of rain fell in a period of 18 hours. The extreme rainfall caused flooding of the upper catchment which has been estimated to be in the region of a 1 in 200-year return period event. The flooding led to the rapid filling of the Ulley Reservoir and subsequent large flows being discharged down the old masonry spillway along the left mitre of the embankment. The total estimated peak outflow during the event has been reported to be 10m³/s, however only 6.1m³/s of that was carried by the old masonry spillway which defined top water level, with the remaining flow discharged by the 1943 spillway with a higher weir level. It has been reported that the peak velocities in the masonry channel were believed to have been in excess of 8m/s, a high velocity at which damage to a historic masonry structure can be expected.

The duration, discharge and velocity magnitudes subsequently resulted in the disintegration of the old masonry spillway walls which led to the rapid erosion of the toe and downstream shoulder of the embankment. It has been reported that the eroded hole was some 50m long and 6m deep with the total horizontal headcut into the downstream shoulder estimated to be approximately 8m. It has also been reported that approximately 2,500tonnes of stone was required to fill the hole following the incident, which equates to a loss of fill material in the region of 1,200m³.

The dam did not fail but emergency measures were put in place including the evacuation of a large number of people in the immediate downstream area and closure for a period of time of the M1 motorway.

If it was not for the rapid response by the Rotherham Metropolitan Borough Council (RMBC) and speedy arrival of the Reservoir Supervising Engineer, the rapid erosion process would have continued, potentially resulting in the catastrophic failure of the embankment and subsequent uncontrolled release of water downstream, likely to have resulted in significant loss of life and substantial damage to properties.

A detailed timeline of the incident is given in the following table collated from available papers on the Ulley incident and from the Supervising Engineer's account of the events.

Ulley Reservoir Incident: Timeline

Date	Time	Event / Comment
25 th June 2007	15:00	Heavy rainfall. Spillway checked and found to be intact.
	17:00 – 18:00	Estimated time when onset of damage to masonry spillway occurred. (Based on photos taken at 15:00)
	20:30	Signs of damage and risk of erosion of the embankment fill identified.
	22:00	Engineer from RMBC arrives on-site and identified that the situation is critical. Supervising Engineer is notified of the problem and requested to attend the site.
26 th June 2007	00:00	Supervising Engineer arrived at the site.
	01:30	Request put in by the Chief Executive of the Council that areas downstream be evacuated. An estimated 1,000 people were evacuated.
	08:30	Spillway blocked by an 8tonne skip lowered into the masonry channel entrance. 15 No. intermediate bulk containers filled with gravel were packed around the skip. This successfully reduced flow in the channel to allow inspection of the erosion damage.

Embankment Shoulder Erodibility

Due to the similarities between Ulley Reservoir and Buckhole Reservoir in terms of the spillway arrangement, spillway type and embankment materials, it is considered reasonable to assume that the knowledge of the events that occurred at Ulley Reservoir can be used to support reasonable engineering assumptions regarding the response of the spillway and dam at Buckhole Reservoir to a similar extreme flood event.

The available literature indicates that duration of the rainfall event was approximately 18 hours, whilst the timeline suggests that the total damage period was approximately 15.5 hours. Therefore, for an 8m horizontal headcut into the downstream shoulder of the embankment over the stated damage period, a constant erosion rate can be estimated to be approximately 520mm/hr. Assuming a spillway side wall height of 1.5m, the estimated erosion rate is consistent with an erodibility coefficient of the shoulder material $K_d = 0.1$.

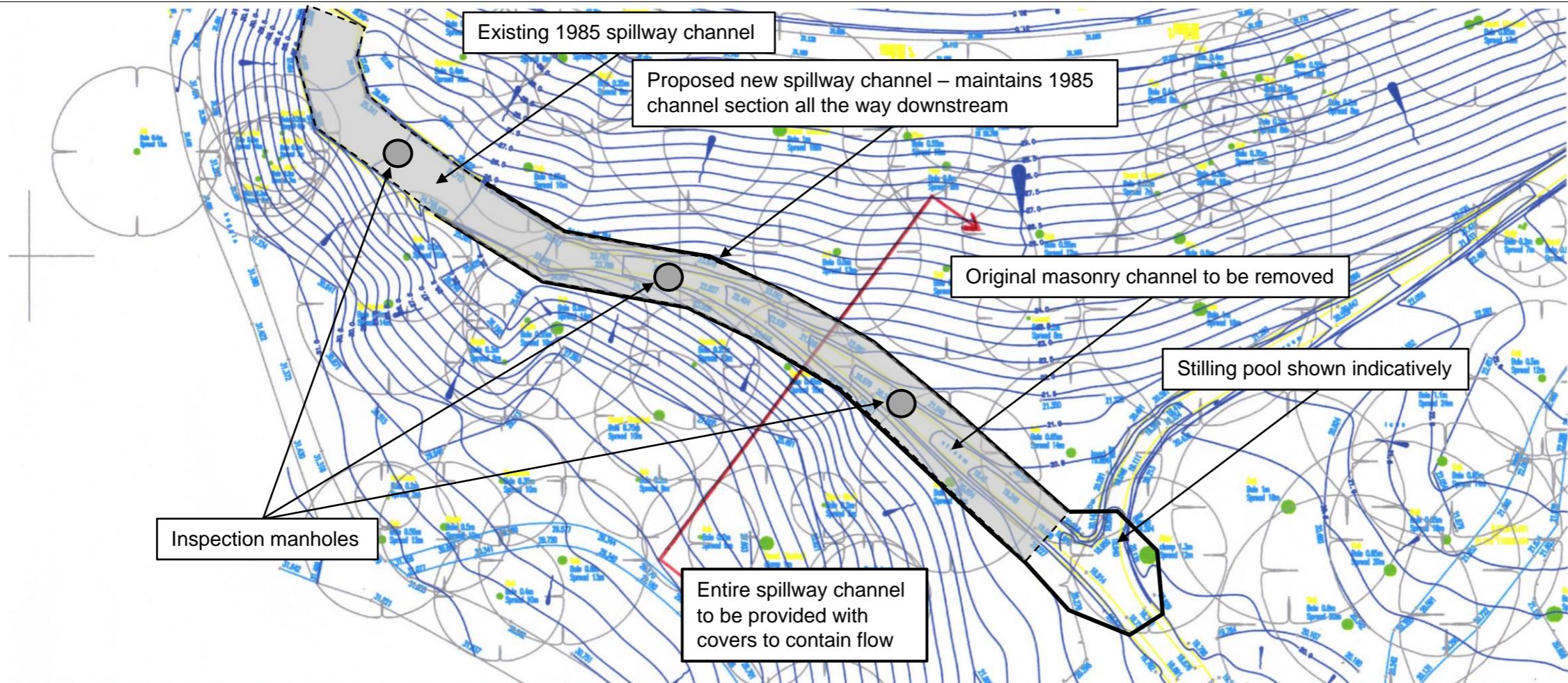
However, it should be noted that a constant averaged erosion rate has been estimated based on the entire period and this value would more likely have varied significantly with time, flow velocity and flow depth during the flood event. Therefore, it is considered reasonable to assume that the fill material at the site actually had a slightly larger erodibility coefficient. The upper limit for a moderately resistant soil material of $K_d = 0.5$ has been assumed to be a reasonable representation of the erodibility of the soil at Ulley Reservoir.

For the purpose of the Buckhole Reservoir ALARP assessment, and noting the general similarities between the Buckhole and Ulley sites, an erodibility coefficient of $K_d = 0.5$ has been used to estimate the expected extent of erosion damage at Buckhole.

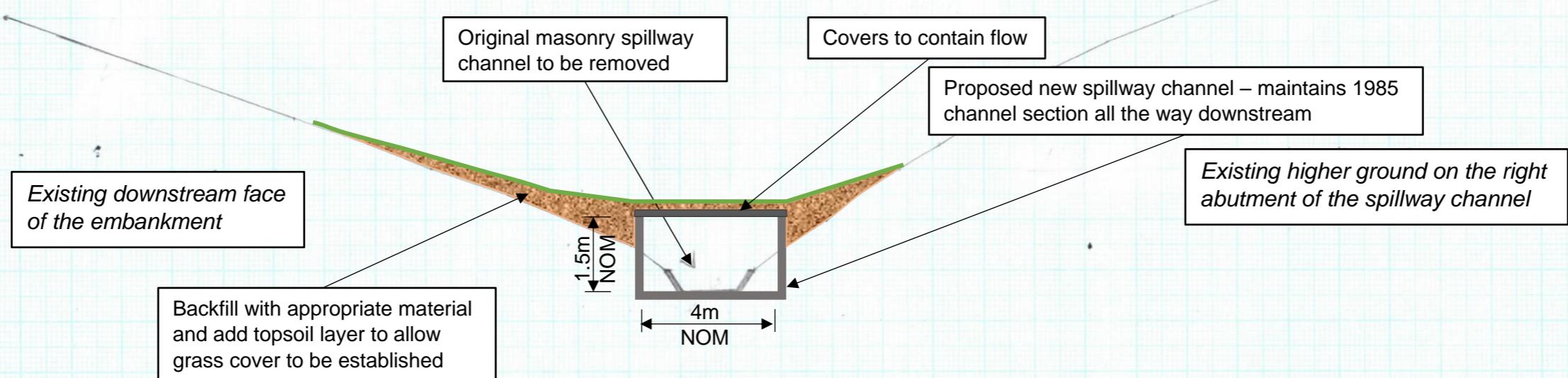
References

- Crook D, Kelham P, Phillips D and Machin I (2008). *Supervising Engineer's Account and Reflections on a Major Reservoir Safety Incident*. Ensuring Reservoir Safety into the Future: Proceedings of the 15th Conference of the British Dam Society. Thomas Telford, London, 238-250.
- Crook D, Claydon J, Kelham P, King R, Phillip D (2010). Design of Rehabilitation Works at Ulley Reservoir. Managing dams: Challenges in a time of change. Proceedings of the 16th Conference of the British Dam Society. Thomas Telford, London.
- Hinks JL and Mason PJ (2007). *Ulley Dam: Post-incident review*. Environment Agency, Bristol.
- Hinks JL and Mason PJ (2008). *Security of stepped masonry spillways: Lessons from Ulley Dam*. Dams and Reservoirs, 18, No. 1, 5-8.
- Hinks JL, Mason PJ and Claydon JR (2008). *Ulley Reservoir and High Velocity Spillway Flows*. Ensuring Reservoir Safety into the Future: Proceedings of the 15th Conference of the British Dam Society. Thomas Telford, London, 227-237.
- USBR (2015). *Best Practices in Dam and Levee Safety Risk Analysis. Section D-1: Erosion of Rock and Soil*. United States Bureau of Reclamation.
- Bowles D et al (2013). *Guide to risk assessment for reservoir safety management: Volume 2 – Methodology and supporting information*. Environment Agency, Bristol.

Appendix F Layout Sketches for Short-listed Options



PLAN VIEW OF SPILLWAY CHANNEL SHOWING PROPOSED NEW CHANNEL

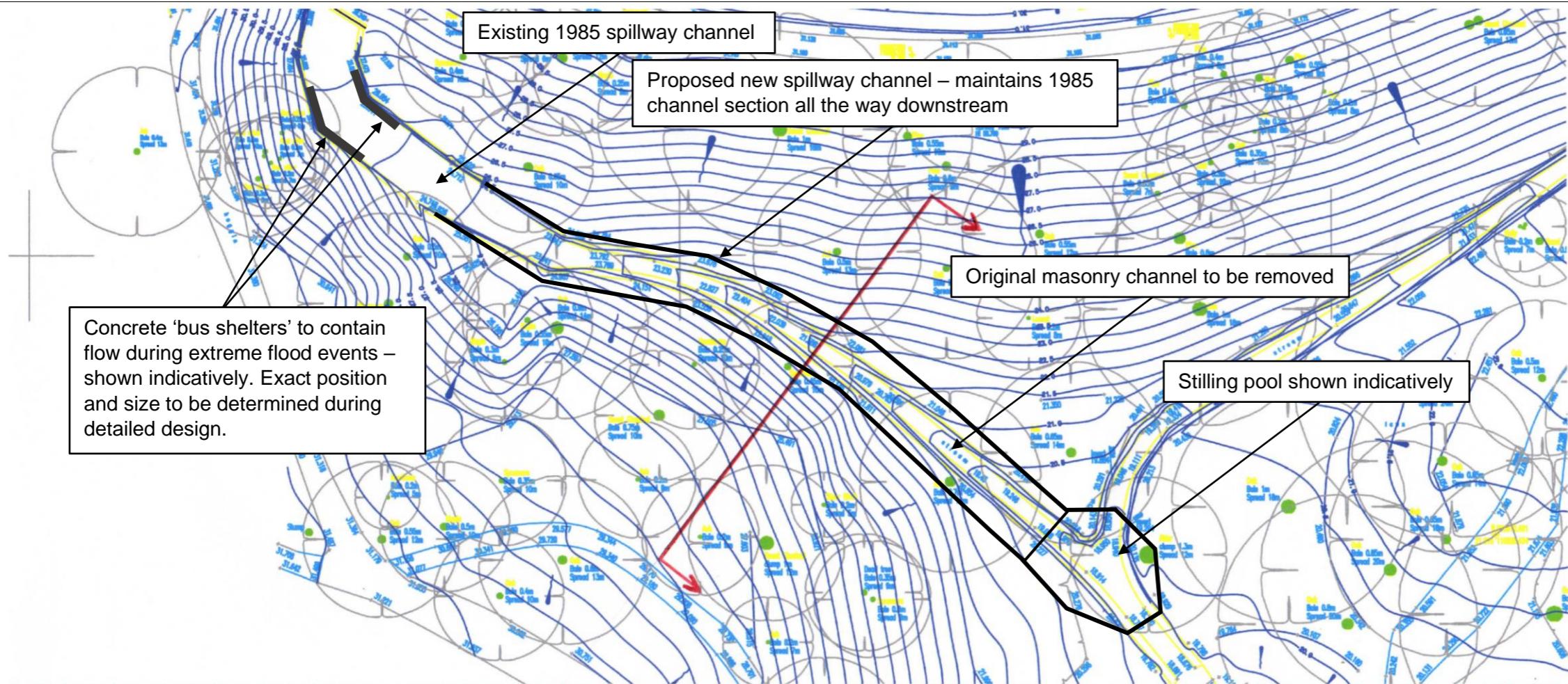


SECTION THROUGH SPILLWAY CHANNEL LOOKING DOWNSTREAM

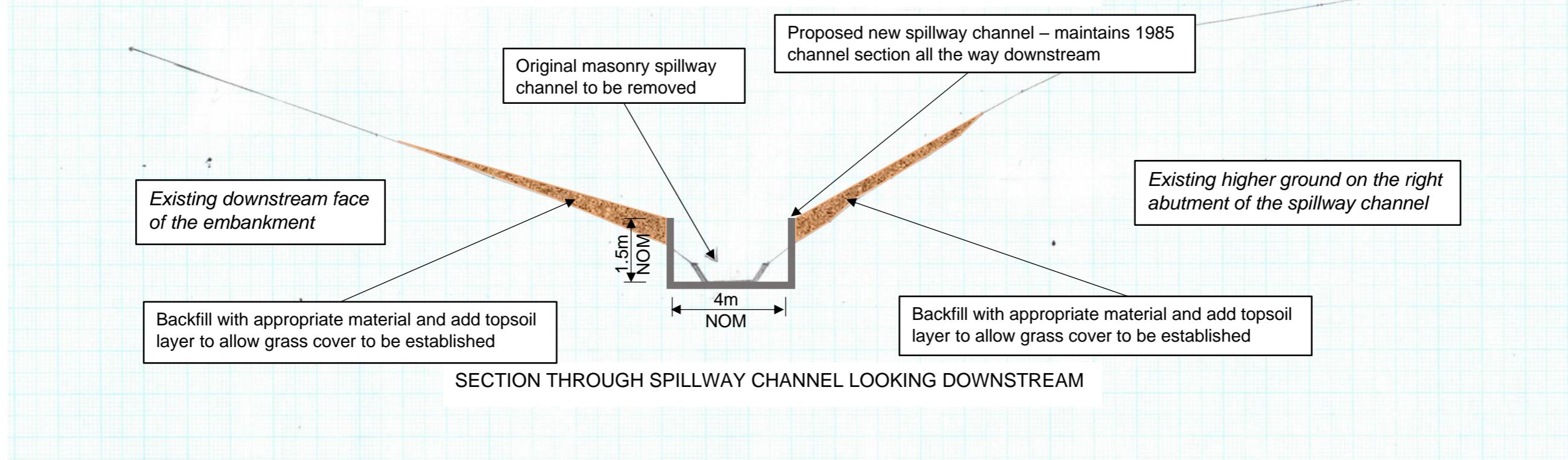
Notes:

1. Not to scale
2. All levels and dimensions will need to be refined during detailed design.
3. Concrete / masonry arisings to be broken up on site and carted away for off-site disposal.

Client:	Hastings Borough Council
Project:	Buckhole Reservoir Spillway Chute ALARP Study
Drawing title:	Option 2
Drawing number:	N/A
Date:	September 2019



PLAN VIEW OF SPILLWAY CHANNEL SHOWING PROPOSED NEW CHANNEL

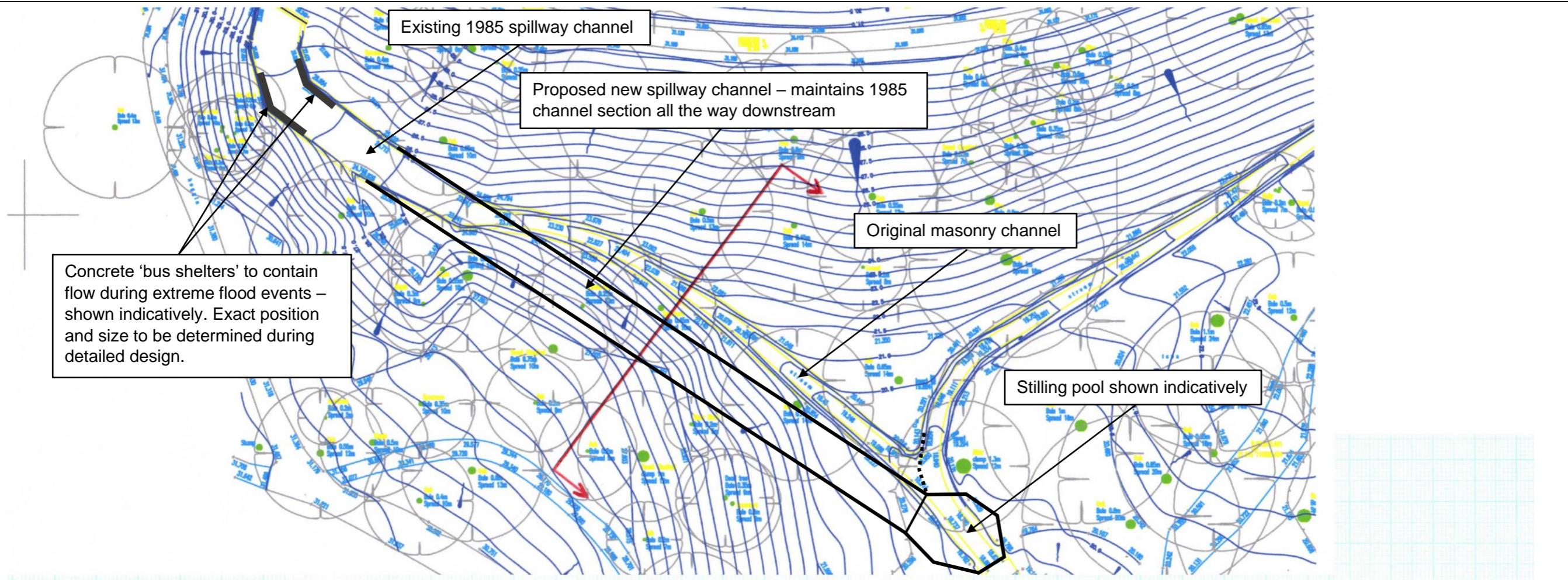


SECTION THROUGH SPILLWAY CHANNEL LOOKING DOWNSTREAM

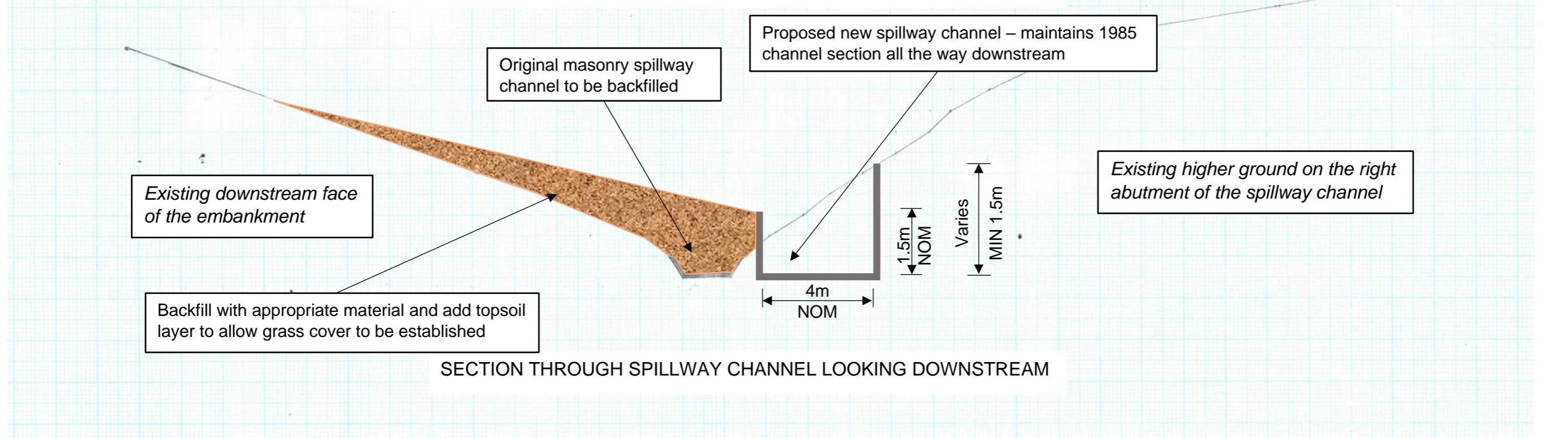
Notes:

1. Not to scale
2. All levels and dimensions will need to be refined during detailed design.
3. Concrete / masonry risings to be broken up on site and carted away for off-site disposal.

Client:	Hastings Borough Council
Project:	Buckhole Reservoir Spillway Chute ALARP Study
Drawing title:	Option 3
Drawing number:	N/A
Date:	September 2019



PLAN VIEW OF SPILLWAY CHANNEL SHOWING PROPOSED NEW CHANNEL

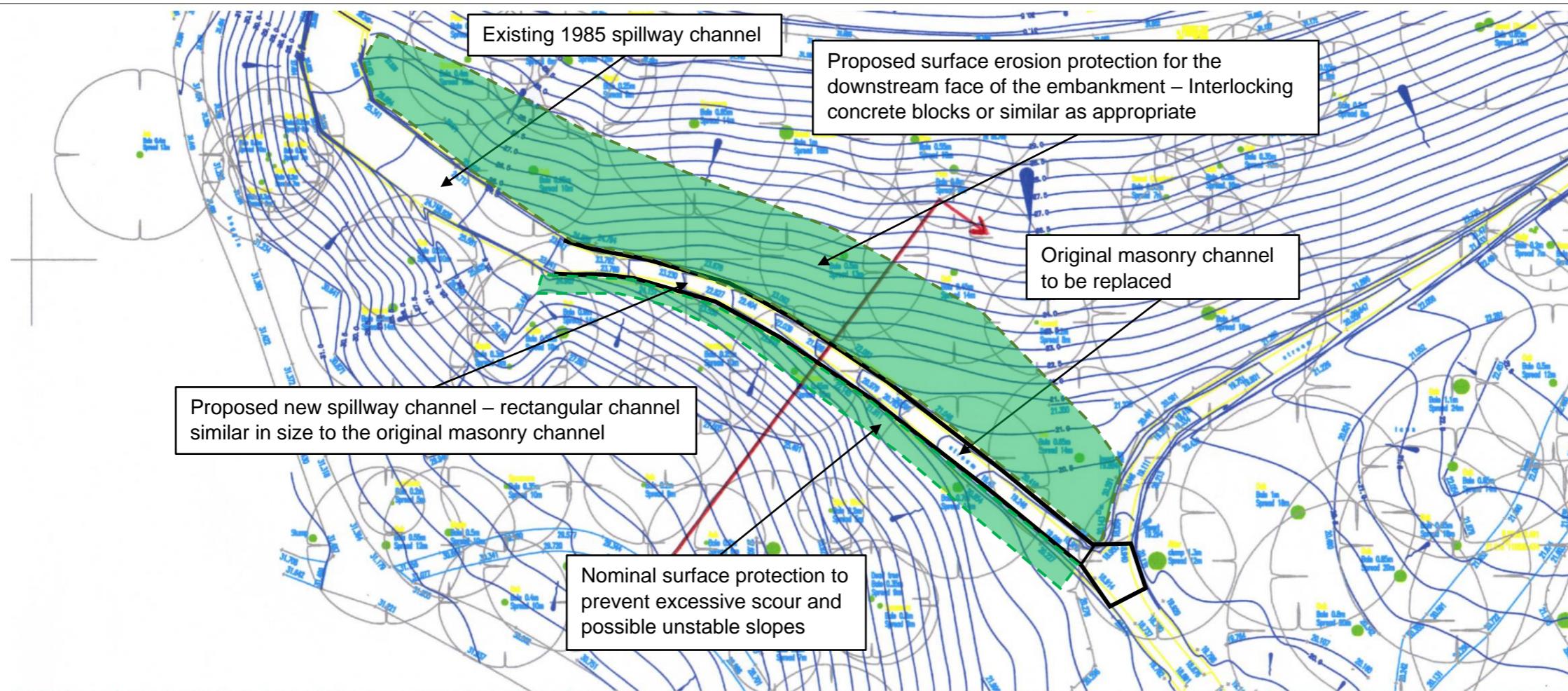


SECTION THROUGH SPILLWAY CHANNEL LOOKING DOWNSTREAM

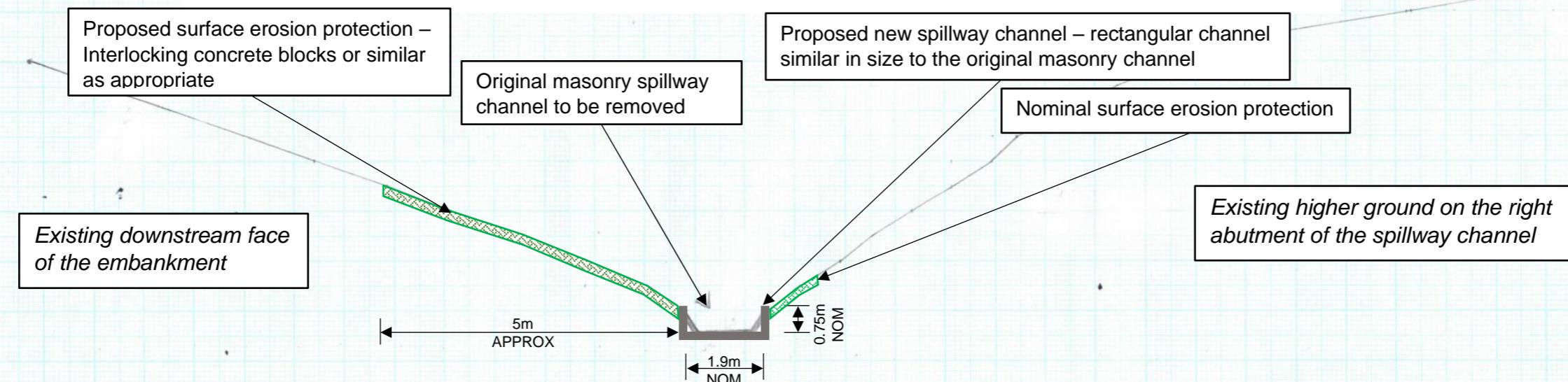
Notes:

1. Not to scale
2. All levels and dimensions will need to be refined during detailed design.
3. Concrete / masonry risings to be broken up on site and carted away for off-site disposal.

Client:	Hastings Borough Council
Project:	Buckhole Reservoir Spillway Chute ALARP Study
Drawing title:	Option 4
Drawing number:	N/A
Date:	September 2019



PLAN VIEW OF SPILLWAY CHANNEL SHOWING PROPOSED NEW CHANNEL AND EROSION PROTECTION



SECTION THROUGH SPILLWAY CHANNEL LOOKING DOWNSTREAM

Notes:

1. Not to scale
2. All levels and dimensions will need to be refined during detailed design.
3. Concrete / masonry risings to be broken up on site and carted away for off-site disposal.

Client:	Hastings Borough Council
Project:	Buckhole Reservoir Spillway Chute ALARP Study
Drawing title:	Option 7
Drawing number:	N/A
Date:	September 2019

Appendix G Cost Estimates for Short-listed Options

Buckhole Reservoir

Option 2: Construct new enlarged channel and add covers to contain flow

20

Weeks Duration

<i>Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Rate</i>	<i>Amount</i>
A1	Enabling Works and Contractor Items				£120,000.00
A1.1	Prelims	wk	20	£5,000.00	£100,000.00
A1.4	Temporary diversion of flows	wk	20	£1,000.00	£20,000.00
A2	Demolition of existing channel				£19,344.91
A2.1	Demolish section of 1985 channel	m ³	26.56	£172.00	£4,568.26
A2.2	Demolish original masonry channel all the way to downstream toe	m ³	107.5	£98.00	£10,535.00
A2.3	Allowance for double handling concrete arisings	m ³	134.06	£15.72	£2,107.42
A2.4	Break up and cartaway arisings	m ³	134.06	£15.92	£2,134.23
A3	Earthworks				£10,023.75
A3.1	General excavation for new channel	m ³	275	£25.00	£6,875.00
A3.2	Disposal of material off site (within 5km) - Half of material	m ³	137.5	£15.00	£2,062.50
A3.3	Double handling of half of excavated material for re-use	m ³	137.5	£7.90	£1,086.25
A4	Construct new channel				£95,710.25
A4.1	Blinding concrete	m ³	6	£184.00	£1,104.00
A4.2	Formwork	m ²	370.00	£80.00	£29,600.00
A4.3	Reinforced concrete	m ³	150	£231.00	£34,650.00
A4.4	Reinforcement - assume 125kg/m ³	tn	18.75	£1,575.00	£29,531.25
A4.5	Backfill sides of new channel with selected excavated material	m ³	137.5	£6.00	£825.00
A5	Channel covers				£119,868.80
A5.1	Install channel covers	m ²	374.59	£320.00	£119,868.80
A6	Stilling basin				£40,000.00
A6.1	Construct stilling basin	Sum	1	£40,000.00	£40,000.00
	Sub-Total A				£404,947.71
B1	Contractor's profit (10% of construction total)	%	10	£404,947.71	£40,494.77
	Sub-Total B				£445,442.48
C2	Optimism bias	%	50	£445,442.48	£222,721.24
	Sub-Total C (Construction Total)				£668,163.72
D1	Design, pre-construction management, health & safety	%	20	£668,163.72	£133,632.74
D2	Principal Designer	Hours	112	£65.00	£7,280.00
D3	Site Supervision	Hours	560	£65.00	£36,400.00
D4	QCE	Hours	160	£85.00	£13,600.00
D5	Expenses	Sum	1	£1,512.00	£1,512.00
C6	Allowance for Investigations at design stage	Sum	1	£30,000.00	£30,000.00
	Sub-Total D				£222,424.74
	Grand Total				£890,588.47
	Grand Total (Rounded)				£900,000.00

Buckhole Reservoir

Option 3: Construct new enlarged open channel following footprint of existing channel

18	Weeks Duration
----	----------------

<i>Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Rate</i>	<i>Amount</i>
A1	Enabling Works and Contractor Items				£108,000.00
A1.1	Prelims	wk	18	£5,000.00	£90,000.00
A1.4	Temporary diversion of flows	wk	18	£1,000.00	£18,000.00
A2	Demolition of existing channel				£19,355.64
A2.1	Demolish section of 1985 channel	m ³	26.56	£172.00	£4,568.26
A2.2	Demolish original masonry channel all the way to downstream toe	m ³	107.5	£98.00	£10,535.00
A2.3	Allowance for double handling concrete arisings	m ³	134.06	£15.80	£2,118.14
A2.4	Break up and cartaway arisings	m ³	134.06	£15.92	£2,134.23
A3	Earthworks				£10,023.75
A3.1	General excavation for new channel	m ³	275	£25.00	£6,875.00
A3.2	Disposal of material off site (within 5km)	m ³	137.5	£15.00	£2,062.50
A3.3	Double handling of half of excavated material for re-use	m ³	137.5	£7.90	£1,086.25
A4	Construct new channel				£95,710.25
A4.1	Blinding concrete	m ³	6	£184.00	£1,104.00
A4.2	Formwork	m ²	370.00	£80.00	£29,600.00
A4.3	Reinforced concrete	m ³	150	£231.00	£34,650.00
A4.4	Reinforcement - assume 125kg/m ³	tn	18.75	£1,575.00	£29,531.25
A4.5	Backfill sides of new channel with selected excavated material	m ³	137.5	£6.00	£825.00
A6	Stilling basin				£40,000.00
A6.1	Construct stilling basin	Sum	1	£40,000.00	£40,000.00
Sub-Total A					£273,089.64
B1	Contractor's profit (10% of construction total)	%	10	£273,089.64	£27,308.96
Sub-Total B					£300,398.60
C2	Optimism bias	%	50	£300,398.60	£150,199.30
Sub-Total C (Construction Total)					£450,597.90
D1	Design, pre-construction management, health & safety	%	20	£450,597.90	£90,119.58
D2	Principal Designer	Hours	104	£65.00	£6,760.00
D3	Site Supervision	Hours	504	£65.00	£32,760.00
D4	QCE	Hours	144	£85.00	£12,240.00
D5	Expenses	Sum	1	£1,404.00	£1,404.00
C6	Allowance for Investigations at design stage	Sum	1	£50,000.00	£50,000.00
Sub-Total D					£193,283.58
Grand Total					£643,881.48
Grand Total (Rounded)					£650,000.00

Buckhole Reservoir

Option 4: Construct new enlarged open channel cutting into the right bank of mitre and maintaining a straight line all the way downstream from the 90° bend

20

Weeks Duration

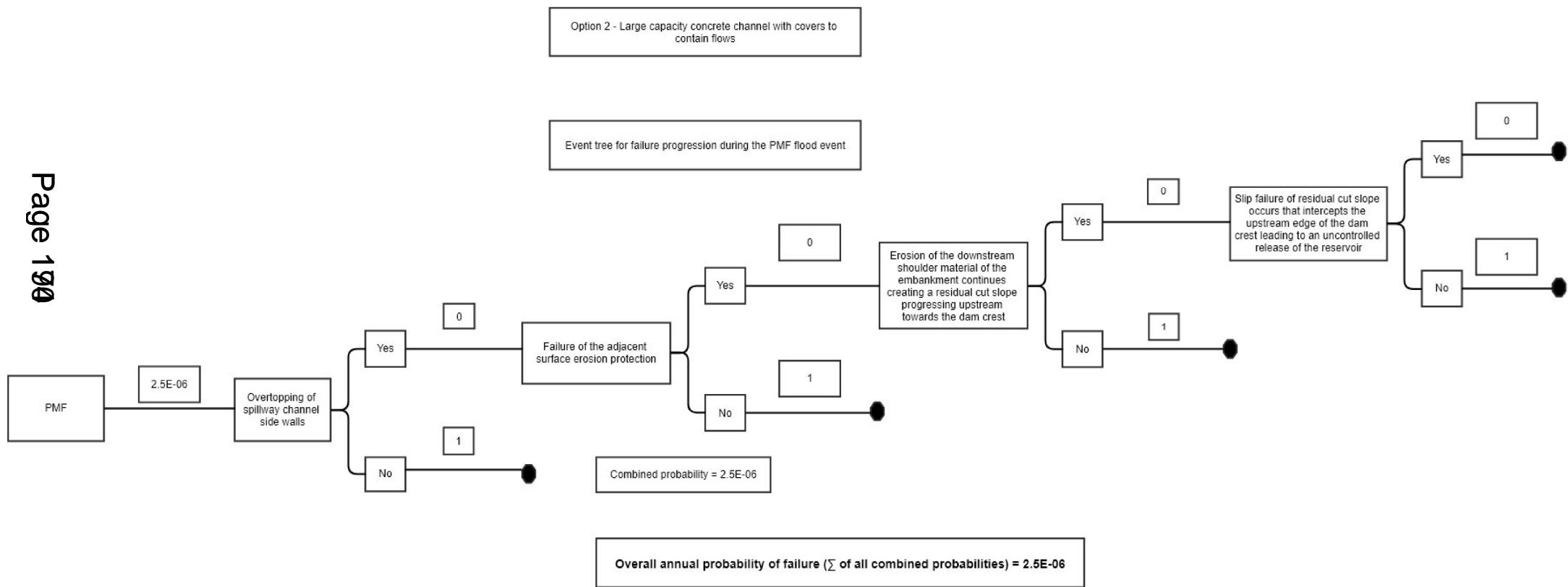
Item No.	Description	Unit	Quantity	Rate	Amount
A1	Enabling Works and Contractor Items				£120,000.00
A1.1	Prelims	wk	20	£5,000.00	£100,000.00
A1.4	Temporary diversion of flows	wk	20	£1,000.00	£20,000.00
A2	Demolition of existing channel				£19,355.64
A2.1	Demolish section of 1985 channel	m ³	26.56	£172.00	£4,568.26
A2.2	Demolish original masonry channel all the way to downstream toe	m ³	107.5	£98.00	£10,535.00
A2.3	Allowance for double handling concrete arisings	m ³	134.06	£15.80	£2,118.14
A2.4	Break up and cartaway arisings	m ³	134.06	£15.92	£2,134.23
A3	Earthworks				£18,000.00
A3.1	General excavation for new channel	m ³	450	£25.00	£11,250.00
A3.2	Disposal of material off site (within 5km)	m ³	450	£15.00	£6,750.00
A4	Construct new channel				£134,885.25
A4.1	Temporary works	Sum	1	£40,000.00	£40,000.00
A4.2	Blinding concrete	m ³	6	£184.00	£1,104.00
A4.3	Formwork	m ²	370.00	£80.00	£29,600.00
A4.4	Reinforced concrete	m ³	150	£231.00	£34,650.00
A4.5	Reinforcement - assume 125kg/m ³	tn	18.75	£1,575.00	£29,531.25
A6	Stilling basin				£30,000.00
A6.1	Construct stilling basin	Sum	1	£30,000.00	£30,000.00
Sub-Total A					£322,240.89
B1	Contractor's profit (10% of construction total)	%	10	£322,240.89	£32,224.09
Sub-Total B					£354,464.97
C2	Optimism bias	%	50	£354,464.97	£177,232.49
Sub-Total C (Construction Total)					£531,697.46
D1	Design, pre-construction management, health & safety	%	20	£531,697.46	£106,339.49
D2	Principal Designer	Hours	112	£65.00	£7,280.00
D3	Site Supervision	Hours	560	£65.00	£36,400.00
D4	QCE	Hours	160	£85.00	£13,600.00
D5	Expenses	Sum	1	£1,512.00	£1,512.00
C6	Allowance for Investigations at design stage	Sum	1	£50,000.00	£50,000.00
Sub-Total D					£215,131.49
Grand Total					£746,828.95
Grand Total (Rounded)					£750,000.00

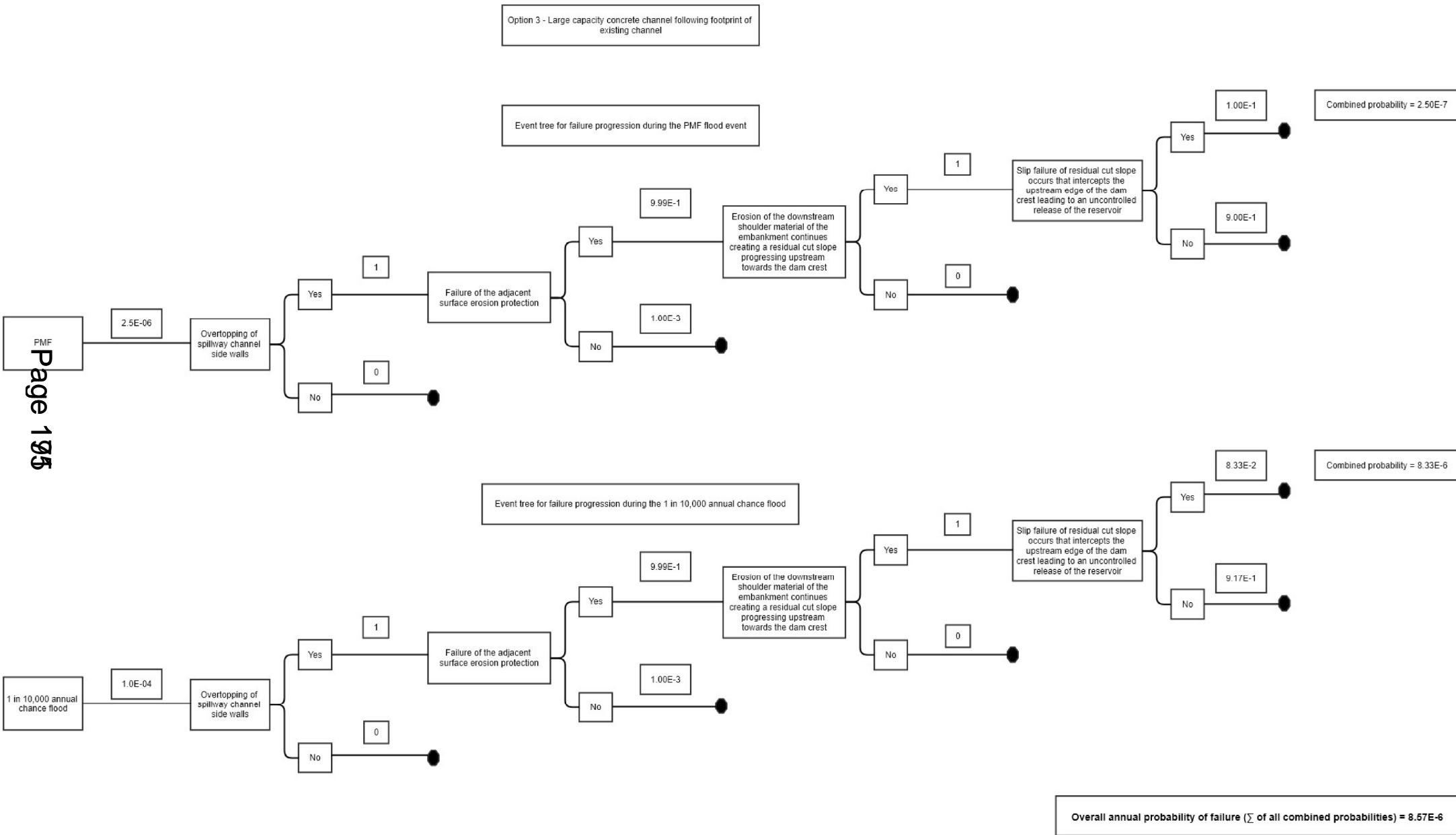
Buckhole Reservoir

Option 7: Re-construct the original trapezoidal channel with a similarly sized rectangular reinforced concrete channel and protect the adjacent embankment slope with appropriate erosion protection measures.

Item No.	Description	Unit	Quantity	Rate	Amount
16	Weeks Duration				
A1	Enabling Works and Contractor Items				£96,000.00
A1.1	Prelims	wk	16	£5,000.00	£80,000.00
A1.4	Temporary diversion of flows	wk	16	£1,000.00	£16,000.00
A2	Demolition of existing masonry channel				£13,944.90
A2.1	Demolish original masonry channel all the way to downstream toe	m³	107.5	£98.00	£10,535.00
A2.2	Allowance for double handling concrete arisings	m³	107.5	£15.80	£1,698.50
A2.3	Break up and cartaway arisings	m³	107.5	£15.92	£1,711.40
A3	Earthworks				£5,000.00
A3.1	General excavation for new channel	m³	125	£25.00	£3,125.00
A3.2	Disposal of material off site (within 5km)	m³	125	£15.00	£1,875.00
A4	Construct new channel				£49,010.63
A4.1	Blinding concrete	m³	5	£184.00	£920.00
A4.2	Formwork	m²	200	£80.00	£16,000.00
A4.3	Reinforced concrete	m³	75	£231.00	£17,325.00
A4.4	Reinforcement - assume 125kg/m³	tn	9.375	£1,575.00	£14,765.63
A5	Erosion protection on embankment downstream face				£26,000.00
A5.1	Concrete blocks (includes installation)	m²	400	£65.00	£26,000.00
A6	Stilling basin				£20,000.00
A6.1	Construct stilling basin	Sum	1	£20,000.00	£20,000.00
	Sub-Total A				£209,955.53
B1	Contractor's profit (10% of construction total)	%	10	£209,955.53	£20,995.55
	Sub-Total B				£230,951.08
C2	Optimism bias	%	50	£230,951.08	£115,475.54
	Sub-Total C (Construction Total)				£346,426.62
D1	Design, pre-construction management, health & safety	%	20	£346,426.62	£69,285.32
D2	Principal Designer	Hours	96	£65.00	£6,240.00
D3	Site Supervision	Hours	448	£65.00	£29,120.00
D4	QCE	Hours	128	£85.00	£10,880.00
D5	Expenses	Sum	1	£1,296.00	£1,296.00
C6	Allowance for Investigations at design stage	Sum	1	£30,000.00	£30,000.00
	Sub-Total D				£146,821.32
	Grand Total				£493,247.94
	Grand Total (Rounded)				£500,000.00

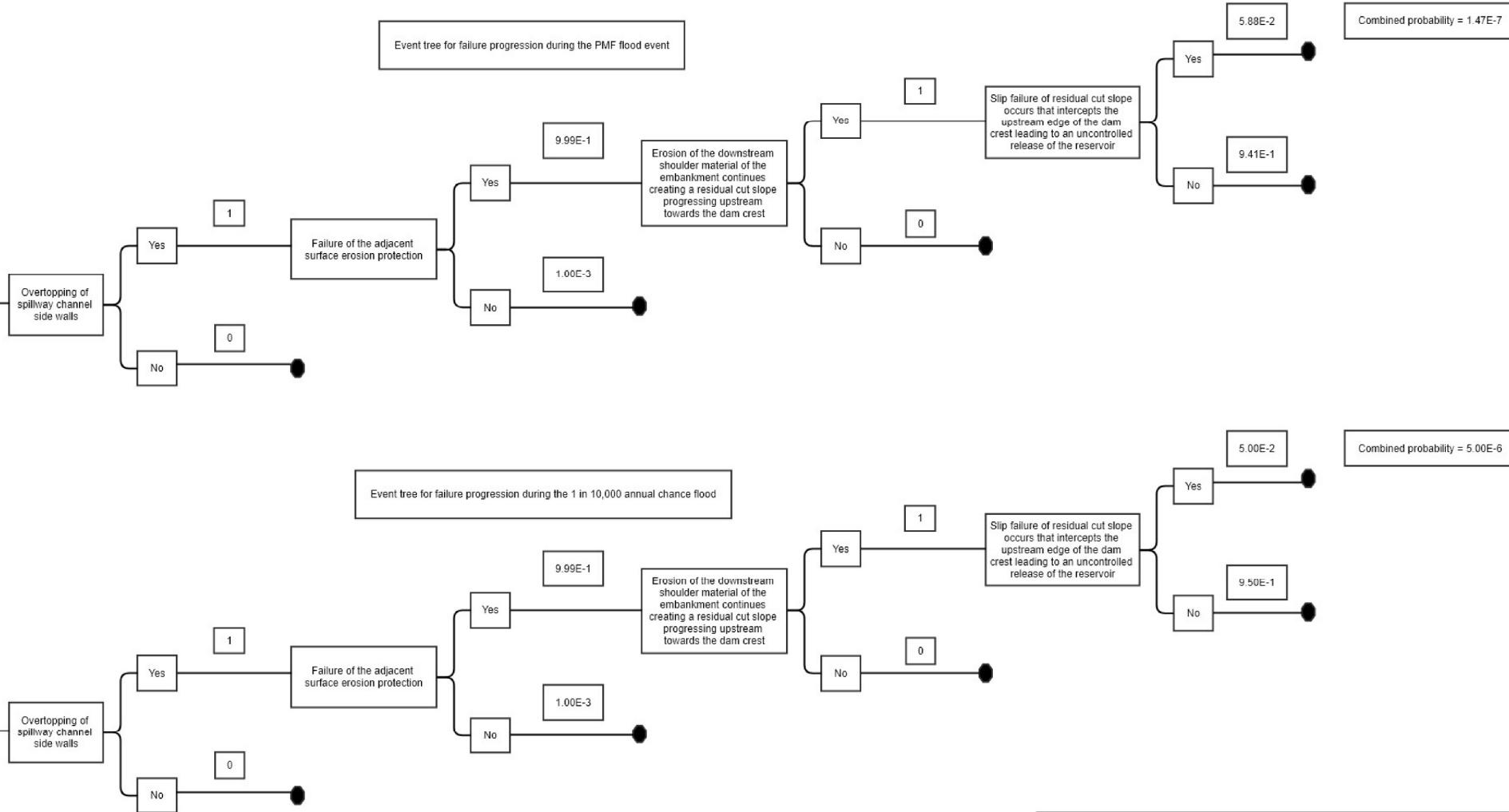
Appendix H Event Tree Analysis for Short-listed Options





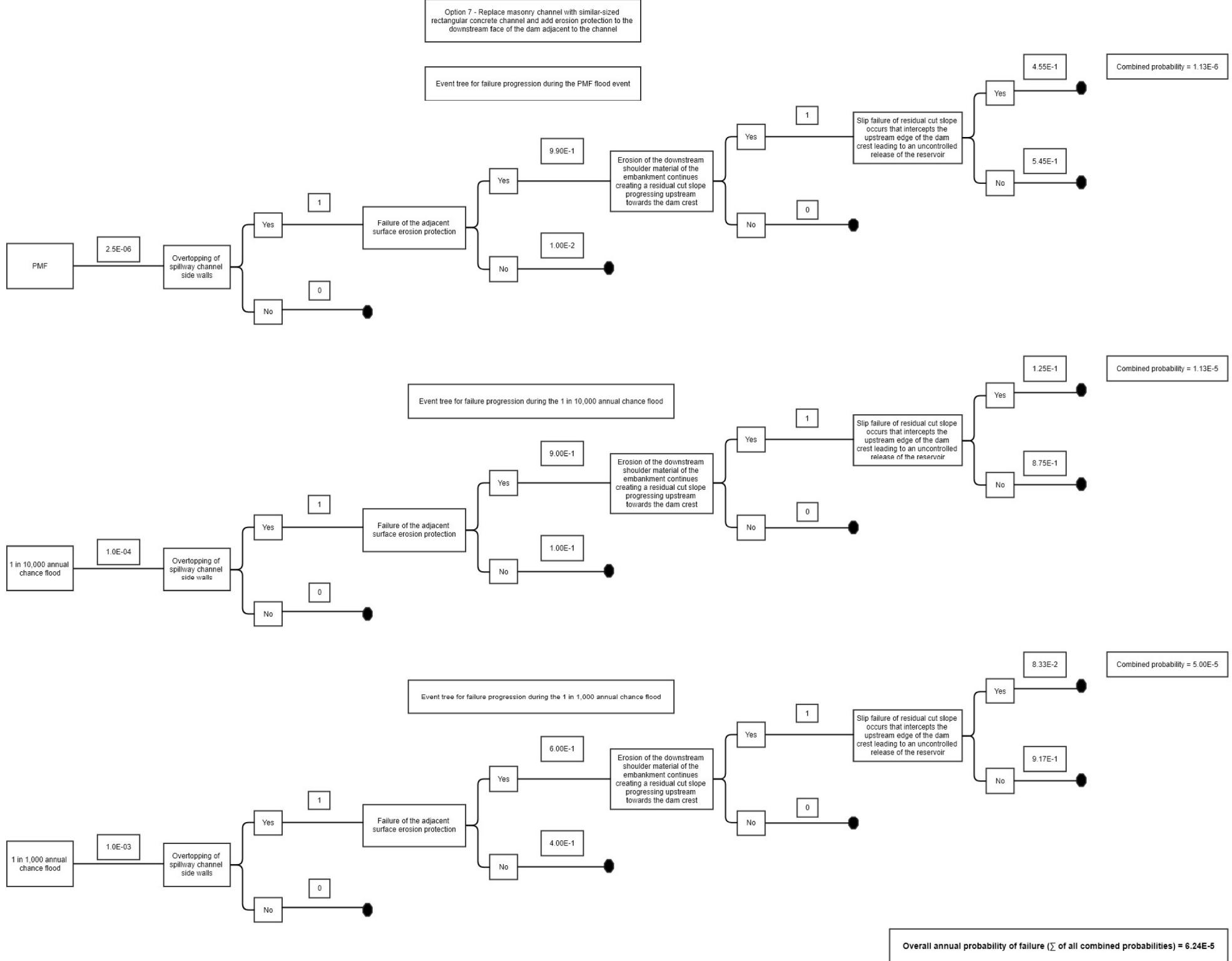
Option 4 - Large capacity concrete channel cutting into right abutment downstream of 90 degree bend

Event tree for failure progression during the PMF flood event



1 in 10,000 annual chance flood

Overall annual probability of failure (Σ of all combined probabilities) = 5.14E-6

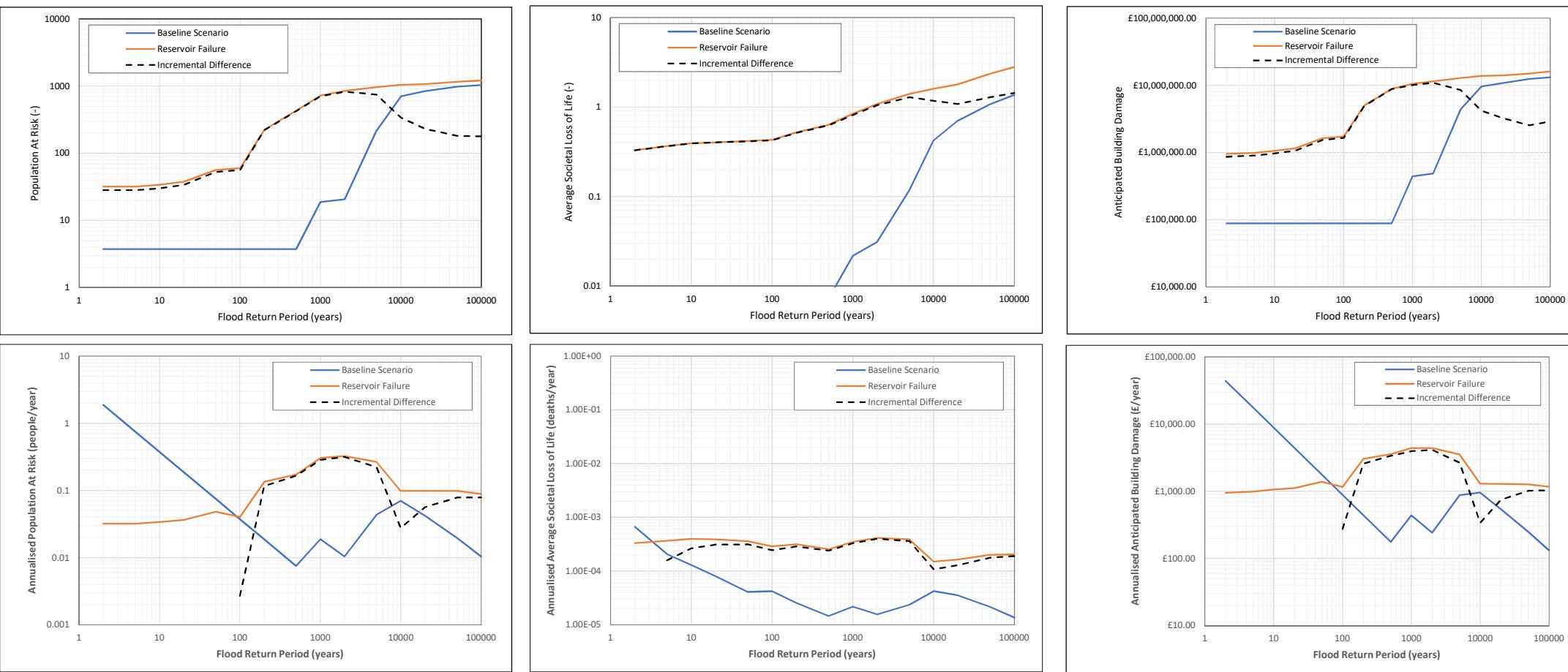


Appendix I CC Hydrodynamics Risk Curves

Descriptions:

Rainy base (RB): Fluvial flood routed through the dam only - no failure of the dam itself
Rainy day dam break (RD): Fluvial flood routed through the dam + failure of the dam
Incremental (inc): Contribution of the dam break to the overall consequences

Return period	Population at risk (PAR)_rainy base	Population at risk (PAR)_rainy day dam break	Incremental population at risk (PAR)	Average societal loss of life (ASLL)_rainy base	Average societal loss of life (ASLL)_rainy day	Incremental average societal loss of life (ASLL)	3rd party property damage (E)_rainy base	3rd party property damage (E)_rainy day dam break	Incremental 3rd party property damage (E)	Annualised PAR_RB	Annualised PAR_RD	Annualised PAR_inc	Annualised ASLL_RB	Annualised ASLL_RD	Annualised ASLL_inc	Annualised E_RB	Annualised E_RD	Annualised E_inc	Probability of dam failure
2	3.76	31.96	28.2	0.001330503	0.329936808	0.328606304	88000	951183.6648	863183.6648	1.88	3.20E-02	-1.85E+00	0.000665252	3.30E-04	-3.35E-04	44000	9.51E+02	-4.30E+04	1.00E-03
5	3.76	31.96	28.2	0.001032983	0.365968164	0.364935181	88000	985644.5725	897644.5725	0.752	3.20E-02	-7.20E-01	0.000206597	3.66E-04	1.59E-04	17600	9.86E+02	-1.66E+04	1.00E-03
10	3.76	33.84	30.08	0.001300357	0.394321991	0.393021634	88000	1056375.997	968375.9973	0.376	3.38E-02	-3.42E-01	0.000130036	3.94E-04	2.64E-04	8800	1.06E+03	-7.74E+03	1.00E-03
20	3.76	37.6	33.84	0.001596942	0.403864119	0.402267177	88000	1155025.723	1067025.723	0.188	3.62E-02	-1.52E-01	7.98471E-05	3.89E-04	3.09E-04	4400	1.11E+03	-3.29E+03	9.63E-04
50	3.76	56.4	52.64	0.002043299	0.415030462	0.415030462	88000	1624205.89	1536205.89	0.0752	4.81E-02	-2.71E-02	4.0866E-05	3.56E-04	3.15E-04	1760	1.39E+03	-3.74E+02	8.53E-04
100	3.76	60.16	56.4	0.004211582	0.429198419	0.424986838	88000	1724842.607	1636842.607	0.0376	4.03E-02	2.71E-03	4.21158E-05	2.88E-04	2.45E-04	880	1.16E+03	2.76E+02	6.70E-04
200	3.76	223.253	219.493	0.005090314	0.520263122	0.515172808	88000	5019930.686	4931930.686	0.0188	1.35E-01	1.16E-01	2.54516E-05	3.13E-04	2.88E-04	440	3.02E+03	2.58E+03	6.03E-04
500	3.76	430.635	426.875	0.0072899	0.632482026	0.625192126	88000	8867991.766	8779991.766	0.00752	1.72E-01	1.65E-01	1.45798E-05	2.53E-04	2.38E-04	176	3.55E+03	3.37E+03	4.00E-04
1000	18.8	721.687	702.887	0.021878374	0.838250643	0.816372269	440000	10493458.52	10053458.52	0.0188	3.03E-01	2.84E-01	2.18784E-05	3.52E-04	3.30E-04	440	4.41E+03	3.97E+03	4.20E-04
2000	20.68	849.083	828.403	0.031203436	1.08068636	1.049482924	484000	11410511.77	10926511.77	0.01034	3.26E-01	3.16E-01	1.56017E-05	4.15E-04	3.99E-04	242	4.38E+03	4.14E+03	3.84E-04
5000	218.49	966.427	747.937	0.118258352	1.404210657	1.285952305	4365680	12862426.73	8496746.733	0.043698	2.66E-01	2.22E-01	2.36517E-05	3.86E-04	3.63E-04	873.136	3.54E+03	2.67E+03	2.75E-04
10000	702.943	1041.961	339.018	0.42253675	1.601307958	1.178771208	9586720	13803156.36	4216436.36	0.0702943	9.79E-02	2.77E-02	4.22537E-05	1.51E-04	1.08E-04	958.672	1.30E+03	3.39E+02	9.40E-05
20000	841.453	1073.254	231.801	0.704058728	1.787472115	1.083413388	10773840	14039310.77	3265470.771	0.04207265	9.84E-02	5.63E-02	3.52029E-05	1.64E-04	1.29E-04	538.692	1.29E+03	7.48E+02	9.17E-05
50000	976.173	1158.539	182.366	1.073145638	2.356660762	1.283515124	12401840	1494485.11	2543018.108	0.01952346	9.80E-02	7.85E-02	2.14629E-05	1.99E-04	1.78E-04	248.0368	1.26E+03	1.02E+03	8.46E-05
100000	1034.294	1213.341	179.047	1.366287393	2.803563034	1.437275642	13162160	16062059.9	2899899.899	0.01034294	8.84E-02	7.81E-02	1.36629E-05	2.04E-04	1.91E-04	131.6216	1.17E+03	1.04E+03	7.29E-05



This page is intentionally left blank

Buckhole Reservoir

Option 3: Construct new enlarged open channel following footprint of existing channel

18

Weeks Duration

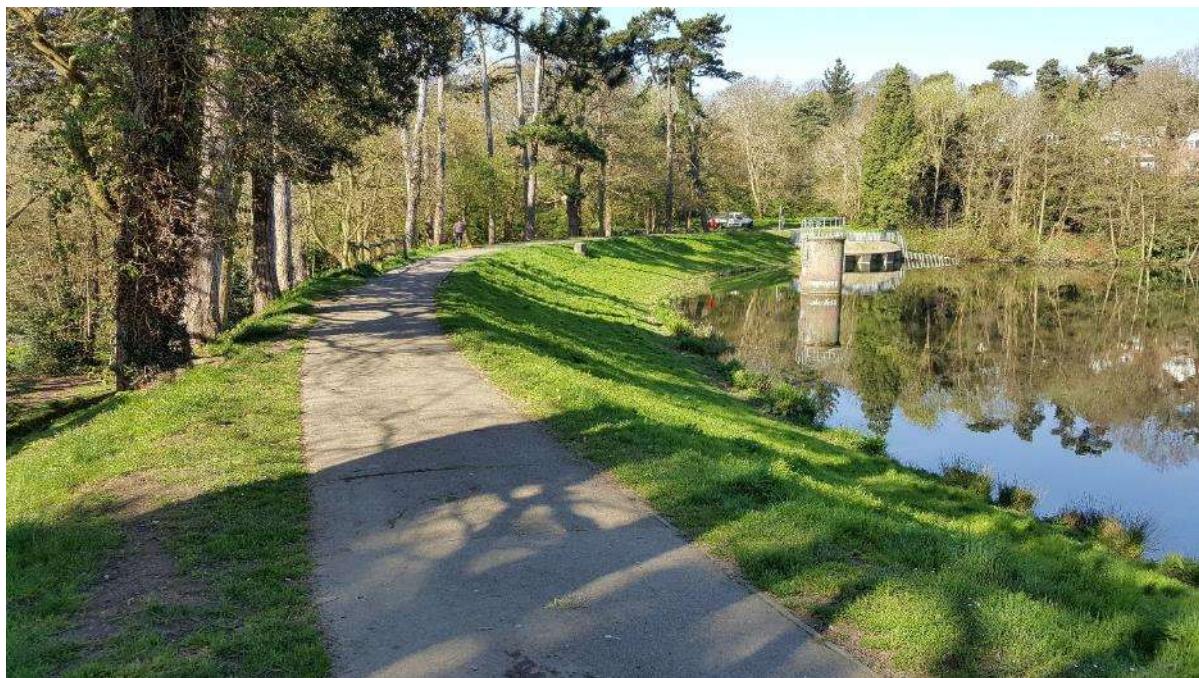
Item No.	Description	Unit	Quantity	Rate	Amount
A1	Enabling Works and Contractor Items				£108,000.00
A1.1	Prelims	wk	18	£5,000.00	£90,000.00
A1.4	Temporary diversion of flows	wk	18	£1,000.00	£18,000.00
A2	Demolition of existing channel				£19,355.64
A2.1	Demolish section of 1985 channel	m ³	26.56	£172.00	£4,568.26
A2.2	Demolish original masonry channel all the way to downstream toe	m ³	107.5	£98.00	£10,535.00
A2.3	Allowance for double handling concrete arisings	m ³	134.06	£15.80	£2,118.14
A2.4	Break up and cartaway arisings	m ³	134.06	£15.92	£2,134.23
A3	Earthworks				£10,023.75
A3.1	General excavation for new channel	m ³	275	£25.00	£6,875.00
A3.2	Disposal of material off site (within 5km)	m ³	137.5	£15.00	£2,062.50
A3.3	Double handling of half of excavated material for re-use	m ³	137.5	£7.90	£1,086.25
A4	Construct new channel				£95,710.25
A4.1	Blinding concrete	m ³	6	£184.00	£1,104.00
A4.2	Formwork	m ²	370.00	£80.00	£29,600.00
A4.3	Reinforced concrete	m ³	150	£231.00	£34,650.00
A4.4	Reinforcement - assume 125kg/m ³	tn	18.75	£1,575.00	£29,531.25
A4.5	Backfill sides of new channel with selected excavated material	m ³	137.5	£6.00	£825.00
A6	Stilling basin				£40,000.00
A6.1	Construct stilling basin	Sum	1	£40,000.00	£40,000.00
Sub-Total A					£273,089.64
B1	Contractor's profit (10% of construction total)	%	10	£273,089.64	£27,308.96
Sub-Total B					£300,398.60
C2	Optimism bias	%	50	£300,398.60	£150,199.30
Sub-Total C (Construction Total)					£450,597.90
D1	Design, pre-construction management, health & safety	%	20	£450,597.90	£90,119.58
D2	Principal Designer	Hours	104	£65.00	£6,760.00
D3	Site Supervision	Hours	504	£65.00	£32,760.00
D4	QCE	Hours	144	£85.00	£12,240.00
D5	Expenses	Sum	1	£1,404.00	£1,404.00
C6	Allowance for Investigations at design stage	Sum	1	£50,000.00	£50,000.00
Sub-Total D					£193,283.58
Grand Total					£643,881.48
Grand Total (Rounded)					£650,000.00

This page is intentionally left blank



Buckhole Reservoir

Report on Options for New Emergency Drawdown Facility



September 2018

Page left blank for double sided printing

Executive Summary

The last Section 10 (S10) Inspection Report for Buckhole Reservoir, dated 7th April 2017, was compiled by Alan Brown of Stillwater Associates Limited. One of the mandatory recommendations stemming from the Section 10 Report stipulates that the drawdown facilities at the dam should be improved and should be able to operate independently from the existing drawdown facility within the draw-off tower. This is due to the fact that the draw-off tower would not be readily and safely accessible in adverse weather conditions.

A previous technical file note (TFN) titled *Options Appraisal for New Draw-down Facility* by Stillwater Associates dated 24th March 2017 considered a long list of options, and identified which should be considered further, which is the subject of this report. The purpose of this report is to provide Hastings Borough Council with the information it needs to make a decision on appropriate and cost-effective measures to meet one of the mandatory recommendations in the interests of safety made in the last section 10. These must be designed and constructed within three years of the S10 report i.e. by April 2020.

Four options have been identified and priced, the table below shows the options with their corresponding cost, relative merits (pros/cons) and an indicative (comparative) maintenance cost.

Option ref.	Option Description	Comment	Pros/Cons	Estimated Project Cost [Indicative Maintenance Cost]
1	Install siphon through existing right-hand spillway weir with pipes extending upstream and downstream	Pipes would be laid at just below top water level and will remain primed. Downstream pipe would be cast in concrete to protect it during spillway operation Encased pipe in downstream channel would reduce capacity of spillway chute, increasing likelihood of scour due to out of bank flow. This option provides the full required drawdown capacity.	Pros: Relatively simple installation; Simple and low cost maintenance; Eliminates existing operational hazards; No new hazards introduced – safe operation. Cons: Pipework within spillway channel will need protecting.	£150,000 (excl. VAT) [Low maintenance cost]
2	Install siphon system centrally to the dam, and passing through the embankment fill, requiring complex construction techniques working from the downstream slope.	Pipes laid at a high level through the dam providing a siphon outlet. New system will provide full drawdown capacity.	Pros: Simple and low cost maintenance; Eliminates existing operational hazards; No new hazards introduced – safe operation. Cons: Complex and therefore costly installation.	£300,000 (excl. VAT) [Low maintenance cost]

Option ref.	Option Description	Comment	Pros/Cons	Estimated Project Cost [Indicative Maintenance Cost]
3	Install gravity system in left bank bypass chamber by modifying the existing pipework.	This system makes use of existing pipework. The level of valves in the chamber is such that it provides only the initial drawdown and would need to be supplemented by mobile pumps. It is noted that the initial installation, and future maintenance would be within a heavily constrained confined space.	Pros: Re-uses existing installation. Cons: Does not satisfy industry good practice (guidance not met); Hazardous environment for maintenance activities, considered unacceptable.	£140,000 (excl. VAT) [Medium maintenance cost due to safety requirements]
Possible additional works to provide extra draw-down resilience should Hastings BC prefer to include this as an extra item.				
Not an option for MIOS See Comment	Draw-off tower refurbishment	Incorporates possible replacement of seized valve and pipework at 24.62m AOD within the draw-off tower. It is noted that the previous Section 10 Report explicitly stated this option is unacceptable to discharge the matters in the interests of safety	Pros: Re-uses (refurbishes) existing installation and therefore relatively low cost installation. Cons: Hazardous environment for both operation and maintenance activities, considered unacceptable.	£50,000 (excl. VAT) [estimated construction cost assumes no design or site supervision required] [Medium maintenance cost due to safety requirements]

Recommended Option

Option 1, siphon through overflow structure, is the recommended preferred option since it provides the full target drawdown capacity in line with the recently published Environment Agency guidance on reservoir emergency drawdown, as well as satisfying the Inspecting Engineer's statutory recommendation in the interests of safety.

This option minimises safety hazards at construction stage, and eliminates existing hazards associated with the current operation and maintenance of valves in the draw-off tower for drawing down the reservoir. This option does not present any new hazards in respect of public safety.

Compared to other options this option will require the least maintenance.

The estimated out-turn cost is £150,000 (excl. VAT), including all anticipated fees for developing the scheme through detailed design and implementation on site. This cost does not include Hastings BC internal costs.

Client:	Hastings Borough Council		
Project:	Buckhole Reservoir		
Document Title:	Report on Options for New Emergency Drawdown Facility		
Project No:	SE108/040		

ORIGINAL	Originator	Checked by	Reviewed by
DRAFT ISSUE	HT Stehle / J Holland	A Brown	D Littlemore
Signature:			
Issue Date:	30 July 2018		
Document Status	Issued for Client review		

REVISION	Originator	Checked by	Reviewed by
FINAL	HT Stehle / J Holland	A Brown	D Littlemore
Signature:			
Issue Date:	22 September 2018		
Document Status	Final issue following comments from/discussions with Client.		

REVISION	Originator	Checked by	Reviewed by
Signature:			
Issue Date:			
Document Status			

REVISION	Originator	Checked by	Reviewed by
Signature:			
Issue Date:			
Document Status			

Contents

Executive Summary	1-2
1 Scope	1
2 Available Data	2
3 Methodology	3
3.1 Guidance	3
3.2 Criteria	5
3.3 Maximum Reservoir Depth (H)	5
3.4 Assessment of Reservoir Inflow	6
3.5 Existing Drawdown Facility	6
4 Options Assessment Process	8
4.1 Introduction	8
4.2 Options Considerations	8
5 Options to Increase Drawdown Capacity	10
5.1 Short-listed Options	10
5.2 Option 1: Siphon Through Existing Overflow Structure	10
5.3 Option 2: Low-level Siphon Through Embankment	13
5.4 Option 3: Refurbish Existing Left Abutment Outlet	15
5.5 Possible additional works: Refurbish Draw-off Tower	17
6 Implications for Existing Drawdown Facilities	19
6.1 By-wash Chamber Outlet Pipe (left bank)	19
6.2 Draw-off Tower Outlet Valves	19
7 Conclusions & Recommendations	21
7.1 General	21
7.2 Reservoir lowering	21
7.3 Summary	21
7.4 Recommended Option	24
8 References	25
Appendix A Conceptual Sketches of the Options	26
Appendix B Costing of Options	27
Appendix C HAZOP Assessment	28

List of Figures

Figure 3-1: Drawdown Guide - Figure 6.2 - Basic recommended standards	4
Figure 3-2: Drawdown Guide - Figure 6.4 - Canal & River Trust approach	4
Figure 5-1: Typical plan layout of the proposed siphon arrangement	12
Figure 5-2: Typical section of the proposed siphon arrangement	13
Figure 5-3: Left abutment by-wash facility modification (ref previous TFN)	16
Figure 5-4: Layout of valves in the draw-off tower	18
Figure 7-1 Flow capacity vs reservoir level	22

List of Tables

Table 2-1: Key dimensions relating to the reservoir	2
Table 3-1: Reservoir drawdown criteria	5
Table 3-2: Typical exceedance flows for Buckhole Reservoir	6
Table 5-1: Summary of short-listed options	10
Table 5-2: Summary of Option 1 in terms of design criteria	11
Table 5-3: Assessment of Option 1	11
Table 5-4: Summary of Option 2 in terms of design criteria	14
Table 5-5: Assessment of Option 2	14
Table 5-6: Summary of Option 3 in terms of design criteria	15
Table 5-7: Assessment of Option 3	16
Table 5-8: Summary of Option 4 in terms of design criteria	17
Table 7-1: Key dimensions of options for drawdown capacity	22
Table 7-2: Comparison of options	23

1 Scope

Buckhole Reservoir is located in Alexandra Park in the middle of Hastings in the County of East Sussex. The Ordnance Survey grid reference of the dam retaining the lake is TQ 806 109 (nearest postcode TN34 2EH). The dam was built in 1852 as part of water supply for Hastings. The current owner is the Hastings Borough Council.

The latest Section 10 (S10) Inspection Report by Alan Brown of Stillwater Associates Limited, dated 7th April 2017, included the following recommendation in the interests of safety:

- c) *Scour capacity is provided to meet the criteria set out in Section 5.8, independent of the draw-off works in the tower which are not readily accessible in adverse weather.*

Section 5.8 of the S10 report stipulates that, in anticipation of the expected target drawdown rates in the Guide to Drawdown Capacity (this Guide has since been published) the reservoir should be capable of being drawn down:

- a) *Initially at 5% of water depth/day, [estimated at the time to be 0.25m/day].*
- b) *To 30% of water depth in 14 days, [estimated at the time to be to a level 1.5m below TWL].*

The S10 report recommends that the equivalent Q₁₀ flow (flow exceeded on 10% of days in a year) be assumed as passing through the reservoir at the time of draw-down.

The Environment Agency guidance, “Guide to Drawdown Capacity for Reservoir Safety and Emergency Planning” was published in August 2017. It should be noted from this guidance that the corresponding target drawdown rates for a Category A dam are:

- a) *Initially at 5% of water depth/day (table 6.2 of drawdown guide), or 0.35m/day*
- b) *To 33% of water depth, i.e. to a level 2.33m below TWL (Section 6.5.4 of drawdown guide, time to reach this level dependent on consequence class as Table 6.4, 7 days considered appropriate)*

The current report follows a Technical File Note (TFN) entitled *Options Appraisal for New Draw-down Facility* by Stillwater Associates dated 24th March 2017. It is intended to address the above-mentioned S10 recommendations by an evaluation of viable options and at the same time seek to satisfy the more recently published industry guidance on drawdown capacity.

2 Available Data

Historical information for the dam was available to Stillwater Associates which included:

- Section 10 Inspection Report (2017) by Alan Brown – Stillwater Associates;
- Previous Section 10 Inspection Report (2006) by Ian C. Carter of Reservoir Safety Services Ltd;
- Records of Crest Level Surveys;
- Bank contour survey by Acad Mapping Ltd dated 27th November 2007;
- Water depth survey by Hastings Borough Council dated 11th July 2008;
- Bathymetric survey by HR Wallingford Ltd dated 17th October 2012;
- As-built drawings of the spillway remedial works;
- As-built drawings of the filling of the existing culvert from the left abutment by-wash chamber dated January 2008;
- As-built drawings of typical scour protection details on upstream face dated February 2008;
- Some drawings of the draw-off tower;
- By-pass chamber survey by Thorne Civil Engineers dated 3rd May 2011;
- Reservoir Flood Map by EA dated 31st October 2017;

The key dimensions relating to the reservoir are summarised in Table 2-1.

Table 2-1: Key dimensions relating to the reservoir

Feature	Units	Value	Source/comment
Reservoir capacity	m ³	59,000	S10 Report (2017)
Reservoir area at TWL	m ²	18,000	
Levels			
Crest – lowest point	m AOD	31.12	S10 Report (2017)
Spillway overflow	m AOD	28.05	
Bed of reservoir	m AOD	22.5	Bathymetric survey
Ground level at downstream toe	m AOD	21.50	see Section 3.3
Stream bed at downstream toe	m AOD	19.00	S10 Report (2017)

According to the 2017 S10 report the dam impounding Buckhole Reservoir has been assessed as Flood category A and Overall Consequence Category B. In the event of failure of the dam, with the uncontrolled release of the reservoir, the chance of the loss of one life is estimated using a rapid screening method as 70%, but the S10 recommended this estimate be reviewed and updated once updated Environment Agency reservoir flood maps were available. Preliminary figures from the Environment Agency suggest a loss of life of 5, which would make it consequence category A2.

3 Methodology

3.1 Guidance

The final version of the “Guide to Drawdown Capacity for Reservoir Safety and Emergency Planning” (The Guide) was published by the Environment Agency in August 2017. The Guide provides a approach for identifying the necessary information and for carrying out an assessment of the existing drawdown capacity of a reservoir. The approach includes consideration of inflows to the reservoir as well as the existing reliable drawdown capacity of the reservoir.

The approach is broken down into a series of steps referred to as “Considerations”, as follows:

Consideration 1: Basic recommended standard: Table 6.2 of the Guide sets out a “Basic recommended standard”, where recommended minimum and maximum drawdown rates are linked to dam consequence category.

Consideration 2: Vulnerability to rapid dam failure: Section 6.4 of the Guide sets out various issues which should be taken into account when assessing the vulnerability of a dam to rapid failure. This vulnerability assessment assists the user in forming a view on how quickly a reservoir may need to be drawn down in an emergency to avoid dam failure.

Consideration 3: Other factors: Section 6.5 of the Guide sets out a range of practical issues which should be taken into account in assessing required drawdown rates. These include, for instance, the likelihood that a problem will be discovered in a timely manner, the time it would take to implement any necessary interventions, how long it would take to draw down the reservoir significantly and how flows can be controlled and accommodated whilst repairs are implemented.

Consideration 4: Precedent: Section 6.6 of the Guide discusses a range of approaches for determining the target drawdown capacity previously applied by reservoir operators and which have been identified as acceptable practice.

Figure 3-1 shows the recommended minimum and upper cap rates for drawdown as stipulated by the Guide for different dam categories. Figure 3-2 shows target durations to draw down 50% of the full storage volume within the reservoir based on the Canal & River Trust approach and discussed in Section 6.6.3 of the Guide.

The Guide does not provide a definitive solution to the question of whether the drawdown arrangements at a dam are adequate or inadequate. The user is directed to apply engineering judgement taking account of the four considerations as outlined in the Guidance. Thus, whilst the components of the assessment can be carried out by technical staff, the overall judgement on adequacy requires the involvement of an appropriately qualified engineer such as a member of the All Reservoirs Panel.

Figure 3-1: Drawdown Guide - Figure 6.2 - Basic recommended standards

Dam category (Note 1)	Recommended minimum rate (Note 2)	Upper cap on practical drawdown rate (Note 3)
A (Note 4)	5%H/day (Note 5)	1m/day
B	3%H/day (Note 5)	0.6m/day
C or D (Note 6)	2%H/day	0.3m/day

Notes:

1. The dam category is defined in *Floods and reservoir safety* (ICE 2015) based on the potential to life and damage downstream if the dam were to fail. Category C dams are those where there would be negligible risk to life and category D dams are those where no loss of life could be foreseen.
2. The rates are based on drawing the reservoir down from top water level.
3. The cap is considered justifiable on the basis that higher dams tend to conform to higher standards of design, construction and general management but where this is not considered the case then it may be appropriate to raise the cap.
4. Category A dams are those 'where a breach could endanger lives in a community'. For particularly large communities, e.g. where the likely loss of life (LLoL) exceeds 100 people, consideration could be given to increasing the recommended rates to drawdown from that shown above.
5. For low height dams where there is a risk to life the drawdown rate should be a minimum of 300mm/day unless there are alternative emergency actions which could be implemented to mitigate the risk.
6. For category C or D dams the recommended standard is based on protecting the value of the dam as an asset and avoiding potential reputational losses which may be associated with dam failure. Departure from the recommended standard could be considered if these potential losses can be tolerated.

Figure 3-2: Drawdown Guide - Figure 6.4 - Canal & River Trust approach

Overall consequence class (Note 1)	Number of days to lower the reservoir to 50% of volume when full, with inflow of winter daily mean flow	
	Surveillance once a week	Surveillance twice a week
A1	3 days	5 days
A2	5 days	7 days
B, C, D	7 days	9 days

Note 1. The consequence classes are as discussed in Section 6.3 except that category A dams are subdivided into two subcategories A1 and A2 (Brown and Gosden 2004). Category A1 dams are those where the likely loss of life would be 100 people or more.

3.2 Criteria

The criteria adopted for assessing options are based on the recommendations contained in the latest Section 10 Report, and also the 2017 drawdown guidance. These are summarised in Table 3-1.

Table 3-1: Reservoir drawdown criteria

No.	Reservoir drawdown criterion	Minimum drawdown capacity required (l/s)	Total drawdown capacity required (l/s) (Notes 1, 3 & 5)
1	Initial rate of 5% of the water depth (H) in one day, with a prevailing Q ₁₀ inflow (Notes 1, 2 & 4)	73	118
2	30% of water depth (H) in 14 days (Notes 1 & 4)	32	77
3	33% of water depth (H) in 7 days (Notes 2 and 4)	70	115

Notes:

1. In accordance with recommendation from S10 Report dated 7th April 2017.
2. In accordance with 2017 drawdown guidance.
3. Sum of the Q₁₀ inflow allowance and the lowering capacity.
4. The depth of water (H) is estimated as 8.55m and the rationale is described in Section 3.3 of this report.
5. Temporary and emergency drawdown capacity, e.g. through bringing to site mobile pumps, should not make up more than 50% of the total capacity deemed necessary.

Although the most recent section 10 report has stated specific criteria for the required drawdown capacity, it should be borne in mind that future inspections may identify other factors, such as a change in the population or property risk downstream, that may require closer compliance with the more recently published guidance. The options in this report have been considered in light of the guidance, with a view to meeting the guidance target drawdown capacity where this is more onerous than the capacity stipulated in the 2017 Section 10 report.

3.3 Maximum Reservoir Depth (H)

The Guide refers to H (in metres) as the maximum reservoir depth, taken as the difference from reservoir top water level to lowest ground level at the downstream toe. The value of H greatly influences the adequacy of a drawdown system as it governs whether the system meets the requirements of section 5.3.2 of the Guide which recommends that additional to the installed drawdown rate (the rate at which the reservoir can be initially lowered), consideration should also be given to the time it will take to empty a significant portion of the reservoir depth. Generally, the Guide recommends evaluating the time it would take to empty the upper third of the reservoir depth which is referred to as T_{33%}, approximately halving the hydrostatic load on the dam.

For the purpose of this report the lowest ground level at the toe may be determined as follows:

- a. With reference to the bank contour survey by Acad Mapping Ltd (2007):
 - i. 19.5m AOD is the invert of the left mitre channel at the toe of the dam, which would give a reservoir depth (H) value of 8.55m.

- ii. 21.5m AOD is the point at the toe of the downstream face, which would give an H of 7.05m
- b. With reference to the bathymetric survey by HRW which shows the maximum water depth in the reservoir as 5.5m.

The rationale of using the downstream toe, as defined in the drawdown guide, is for purposes of assessing the hydraulic gradient across the dam, and thus for this assessment of capacity in accordance with the 2017 drawdown guide, a reservoir depth (H) of **7.0m** will be used.

3.4 Assessment of Reservoir Inflow

The inflows to Buckhole Reservoir cannot be controlled and therefore needs to be considered when assessing the drawdown capacity. The equivalent Q_{10} inflow (the flow exceeded on 10% of days in a year) may be estimated by using the general “English Formula” suggested by Hinks (2009):

$$Q_{10} \text{ (m}^3/\text{s)} = \frac{300 \cdot A \text{ (km}^2\text{)}}{8640}$$

At this reservoir and assuming a catchment area of 2.03km² (as per the latest S10 report) this equation gives a Q_{10} of 70.5 litre/sec.

Generally, if gauged flow data from nearby catchments are available, the daily inflows can be estimated by adjusting the gauged data according to the catchment area of the gauge station relative to the catchment area of the reservoir. Care must be taken to ensure that the catchment characteristics of the chosen gauge station are more or less similar to that of the catchment containing the reservoir. The Guide to Drawdown Capacity for Reservoir Safety and Emergency Planning (EA, 2017) regards this approach as sufficient for use during calculation of drawdown capacity.

Gauged flow statistics are available from the National River Flow Archive (available online at: <https://nrao.ceh.ac.uk/>). The gauging station nearest Buckhole Reservoir is Station Number 41017 located in the Combe Haven River near Crowhurst about five miles north-west of Hastings.

The typical statistical inflows for Buckhole Reservoir estimated from the data available for Station Number 41017 is shown in Table 3-2.

Table 3-2: Typical exceedance flows for Buckhole Reservoir

Exceedance Flow Q_x	Station Number 41017 (Combe Haven) (l/s)	Deduced Buckhole Flows (l/s)
Q_1	4,000	264
Q_{10}	679	45
Q_{50}	126	8
Q_{70}	56	4
Q_{95}	20	1

For the purpose of this report a Q_{10} of 45 litre/sec has been adopted.

3.5 Existing Drawdown Facility

The existing drawdown facility at Buckhole Reservoir comprises a dry well draw-off tower with a central 9-inch cast iron pipe stack fed by a 6-inch draw-off pipe at level 27.47m AOD and an 8-inch draw-off pipe at level 26.05m AOD. There are also two non-operational draw-off pipes lower down: a 9-inch draw-off pipe at 24.62m AOD and a 9-inch draw-off pipe at 21.34m AOD, the latter being the original scour facility. Access to the

tower requires a boat and scaling a ladder on to the tower from the boat. The previous S10 report considered this access to the draw-off tower as difficult and hazardous especially during adverse weather conditions and required that reservoir safety drawdown capacity be independent of the tower facilities.

Although the existing drawdown facility can provide the initial desired drawdown rate, the Section 10 report explicitly stated this option unacceptable in terms of reservoir safety. Furthermore, the lowest drawdown level that can be achieved by the existing facility is 26.05m AOD and this results in 29% of H which does not meet the target of 33% of H indicated by the guidance.

4 Options Assessment Process

4.1 Introduction

A safe means of drawing down the reservoir is a vital aspect of a plan to make the reservoir safe in the event of an emergency, for instance during extreme flood events or should a problem be identified with the dam or spillway.

The previous TFN provided a long list of options for increased drawdown capacity from which a short list of options was developed that were considered viable to be investigated in more detail. The short list of options from that TFN is summarized below:

- Rehabilitate and improve the existing left bank draw-off;
- Install a siphon arrangement through the embankment just below top water level (either a single or a double pipe system);
- Valved outlets/siphons through the existing siphon overflow (requires coring through the concrete weir wall of the siphon structure).

Following on-site discussions with Hastings BC the short-listed options have been refined further and are assessed on their technical merits, anticipated delivery costs and future maintenance requirements.

At the request of Hastings BC this has included adding rehabilitation of the tower valves, although it is noted that the last Section 10 stated that the draw-off tower should be excluded in consideration of emergency drawdown capacity.

4.2 Options Considerations

The review of options has taken account of the following factors.

4.2.1 Technical Viability and Practicality of Implementation

Only options that are technically viable and can practically be implemented have been taken forward for further consideration.

4.2.2 Health & Safety

The CDM 2015 regulations require that health and safety implications are considered throughout the lifetime of a project. For the options considered in this report the following key health & safety aspects have been considered:

Construction phase: advice has been sought from C J Thorne Civil Engineering Contractors, who have first-hand knowledge of Buckhole Reservoir and appurtenant structures, to understand the significant hazards at the time of construction and how they can be mitigated, to provide a view on the relative construction safety of each option.

Operation and Maintenance: a high-level HAZOP exercise (see Appendix C) has been undertaken to understand the likely hazards associated with each option, again to determine the relative safety of each option when it comes to operating a drawdown facility and carrying out maintenance and future replacement work. The key hazards identified are working adjacent to deep water and accessing/working within confined spaces.

Public Safety: safeguarding the public is fundamental. Options have only been carried forward where they present no new hazards to the public. The option of installing a bridge to access the draw-off tower is considered to introduce new or increased hazards to the unauthorised personnel.

4.2.3 Maintenance Requirements

Options carried forward incorporate the minimum of serviceable parts, limited to standard valves, and installed in such a way that helps to ensure ease of future replacements.

Included in this consideration is the issue of vandalism. For instance, the option of installing a new bridge to access the draw-off tower, in conjunction with an option to increase draw-off capacity through the tower, with new valves, opens up the increased risk of vandalism of equipment or malicious operation of valves. Other options exist, which have been carried forward, which are inherently less susceptible to vandalism since access will be restricted as at present, within the physical constraints of existing structures.

4.2.4 Sustainability

All of the options taken forward involve similar materials, primarily concrete for structures, steel for pipes and valves, and plastic for pipes.

In general terms all of the options that are considered technically viable are passive options which, once initiated (valves opened), will continue to operate under gravity until the reservoir water level falls below the upstream inlet level of the draw-off arrangement. None of the options taken forward require a power supply and, in every case, only a very low level of maintenance will be required.

It is considered that there is no notable difference between the options in terms of sustainability.

5 Options to Increase Drawdown Capacity

5.1 Short-listed Options

Four options were considered viable and likely to present cost effective alternatives, and thus form the short list of options, summarised in Table 5-1.

Table 5-1: Summary of short-listed options

Option ref.	Option Description	Option assessment
1	Install siphon through existing right-hand spillway weir & provide full drawdown depth by extending pipes upstream into the reservoir and downstream in the concrete section of the spillway chute.	This option allows a permanent drawdown facility independent of the draw-off tower; it requires coring through the concrete weir and significant lengths of pipe but should be straightforward from a construction point-of-view. Requires minimal future maintenance: servicing and testing of valves.
2	Install siphon system centrally to the dam, and passing through the embankment fill, providing full drawdown depth by extending pipes upstream into the reservoir.	This option requires complex construction techniques working from the downstream slope. A chamber to house the upstream control and air valves is required. Requires minimal future maintenance: servicing and testing of valves.
3	Install gravity system in existing left bank bypass valve chamber by modifying the existing pipework.	This option will pose many challenges from a construction point-of-view due to the limited space available in the existing left abutment by-wash chamber. Requires minimal future maintenance: servicing and testing of valves. However, servicing and maintenance of valves requires working in a heavily constrained confined space raising considerable safety concerns.
Not an option for MIOS. Retained at request of HBC	Refurbishment of pipework and valves in the draw-off tower.	This option poses many challenges from a construction point-of-view as it would involve potentially hazardous (confined space) operations. Access is anticipated to be very difficult even when the reservoir has been partially drained. Requires minimal future maintenance: servicing and testing of valves.

5.2 Option 1: Siphon Through Existing Overflow Structure

This option incorporates a solution that will function entirely independently of the valves in the draw-off tower. Roughly 80m of pipe length will be required to be able to provide full drawdown of the top third of the water depth (33% of H). From a construction point of view this solution will be straightforward as it will only require coring through approximately 1m of an existing concrete weir wall. The remainder of the procedure will involve installing and

fixing the pipe to the correct upstream and downstream levels, the installation of the valves (upstream and downstream gate valves and diaphragm air valve) and casting the downstream section of the pipe in concrete.

The upstream valve would be operated from a new walkway upstream of the concrete siphon chamber. It is anticipated that the downstream valve would be in a new chamber constructed at the back of the concrete wall to the spillway, with 45 degree bends for the pipe to pass through the wall,

This will essentially be a self-primed system based on the assumption that Buckhole Reservoir is generally maintained at TWL. In the case where the system is not able to self-prime or where the system loses its prime during operation, provision can be made to have a vacuum pump on standby to manually prime the system. Figures 5-1 and 5-2 show the general arrangement of the siphon system.

The hydraulic assessment indicated that a 300mm diameter pipe would provide the total required drawdown capacity (as per Table 3-1). This arrangement will provide approximately 140 litre/second of average drawdown capacity. The performance in relation to the criteria is shown in Table 5-2.

Table 5-2: Summary of Option 1 in terms of design criteria

Drawdown Criterion	Equivalent Value	Basis of criterion (see notes)	Option meets criterion [indicative marginal cost for meeting criterion]
Base cost estimate of suggested option: £150,000			
Initial Rate: 5% of H	0.35m/day	S10 and Guide	Yes [None]
30% of H in 14 days	2.1m	S10	Yes [None]
33% of H in 7 days	2.33m	Guide	Yes [None]
Notes: <i>S10 = rate required to comply with recommendation made in the interests of safety</i> <i>Guide = rate required to achieve target under new guidance</i>			

Table 5-3 provides a review of Option 1 in light of the factors listed in Section 4.2.

Table 5-3: Assessment of Option 1

Aspect	Assessment
Health & Safety	Construction Phase: It is anticipated that the installation will be made with the reservoir at least partially drawn down. Coring through the existing overflow weir structure can safely be undertaken from the overflow chamber, with careful planning of the activities and safe systems for moving equipment and materials.

Aspect	Assessment
	Operational Phase: access for operation and maintenance is considered safe, with no confined space entries. This option eliminates the existing access hazards associated with operating valves in the draw-off tower.
Public Safety	No new hazards are introduced. Valves will be protected by locked covers to prevent malicious operation. Exposed pipework will be ductile iron and therefore not prone to being vandalised.
Maintenance	The only maintenance required will be servicing of valves, say every 10years, unless upon testing immediate maintenance is deemed necessary. Access is considered safe for this activity. Maintenance costs considered to be low.
Operation & Testing	Operation can be made safe with valves located within the spillway structure and operated from above. The valves spindles can be protected with secure lockable covers. Testing would be minimal with twice yearly operation of the valves to confirm satisfactory operation of the siphon.

Figure 5-1: Typical plan layout of the proposed siphon arrangement

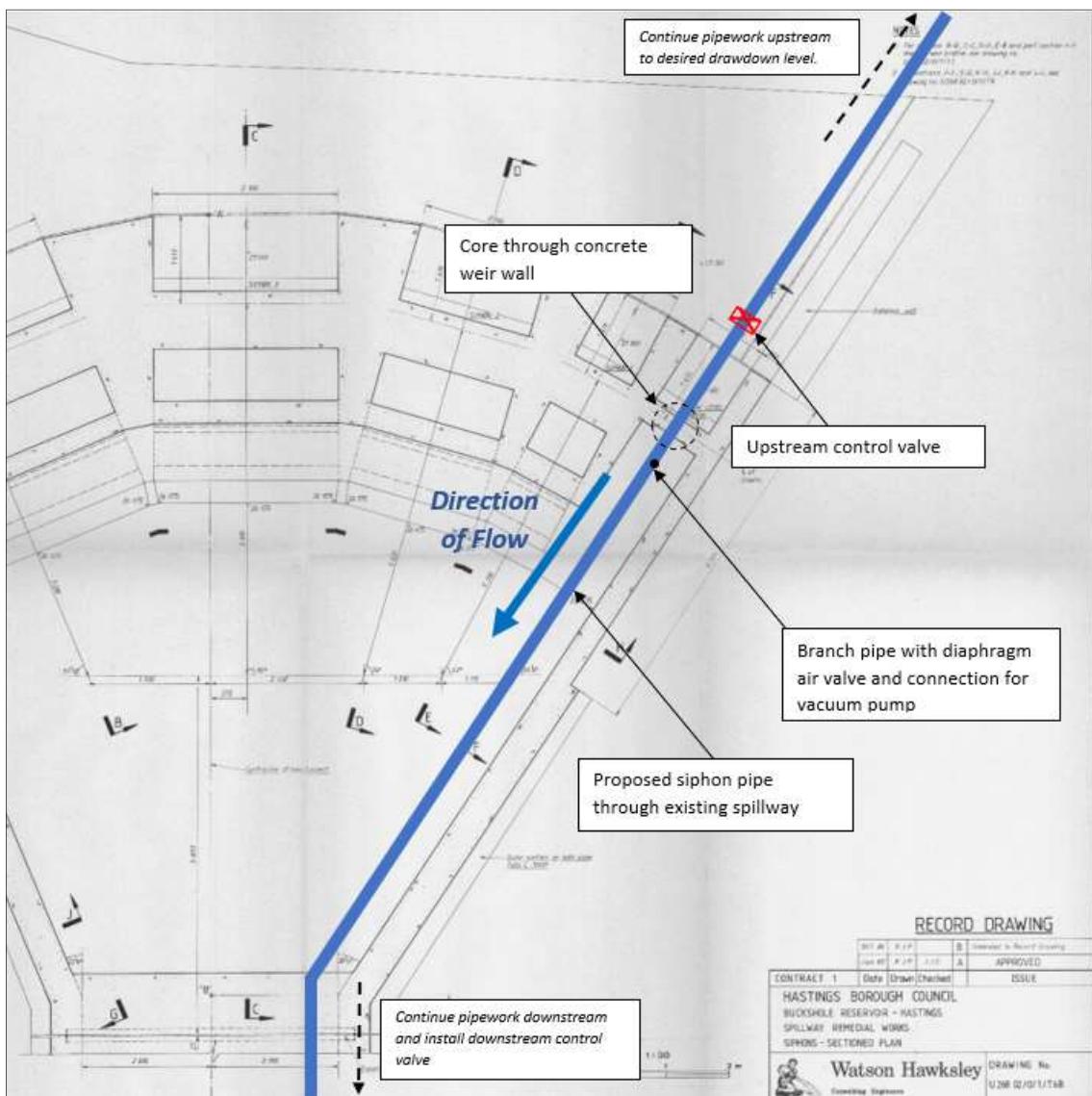
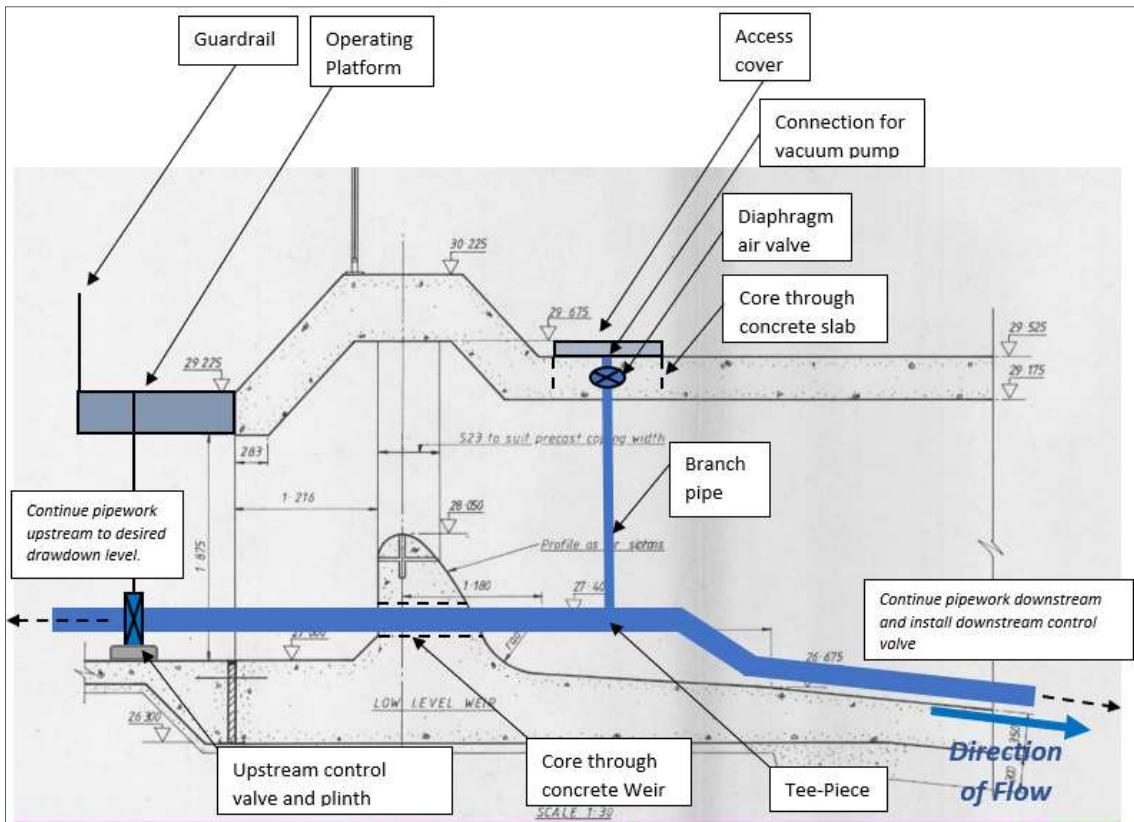


Figure 5-2: Typical section of the proposed siphon arrangement



5.3 Option 2: Low-level Siphon Through Embankment

As is the case with Option 1, this option incorporates a solution that will function entirely independently of the valves in the draw-off tower. This option proposes the installation of a simple siphon arrangement, with the highest point of the pipe set just below top water level, the inlet set approximately 1m below the required draw-down level, and the outlet discharging at a low level into the downstream channel.

Since routes around the left or right banks are highly likely to involve the felling of a number of trees, a shorter route over the dam crest is suggested. From available survey details, and inspection on site, there appears to be a route available that will avoid impacts on trees, on the left side (looking downstream) of the embankment.

An air valve will be required to ensure the highest point of the pipe is kept free of air, and the system primed. The air valve chamber would need to be constructed in the upstream face, with a control valve. The valves would be located within a secure, shallow chamber, with the valves operated with a removable key from the surface. An isolation/control valve will also be required at the downstream end of the pipe to enable priming.

The section of pipe to the point of discharge on the downstream face should be buried, both in terms of aesthetics and security.

It should be noted that considerable care will need to be taken with the design details, and construction of the pipe(s) through the embankment as the watertight element will need to be pierced, and then reinstated to ensure no leakage around the outside of the pipe(s).

Two sub-options are proposed:

- Option 2A is for a single pipe, nominal internal diameter 250mm.
- Option 2B is for a twin pipe system, each pipe nominal internal diameter 150mm.

The key advantages with a twin pipe arrangement are greater flexibility in terms of draw down rate, and greater reliability, for instance if a blockage occurs on one of the pipes.

The performance in relation to the criteria is shown in Table 5-4.

Table 5-4: Summary of Option 2 in terms of design criteria

Drawdown Criterion	Equivalent Value	Basis of criterion (see notes)	Option meets criterion [indicative marginal cost for meeting criterion]
Base cost estimate of suggested option: £300,000			
Initial Rate: 5% of H	0.35m/day	S10 and Guide	Yes [None]
30% of H in 14 days	2.1m	S10	Yes [None]
33% of H in 7 days	2.33m	Guide	Yes [None]
Notes: <i>S10 = rate required to comply with recommendation made in the interests of safety</i> <i>Guide = rate required to achieve target under new guidance</i>			

Table 5-5 provides a review of Option 2 in light of the factors listed in Section 4.2.

Table 5-5: Assessment of Option 2

Aspect	Assessment
Health & Safety	Construction Phase: It is anticipated that the installation will be made with the reservoir at least partially drawn down. Access is anticipated to be very difficult as the installation of the siphon pipe(s) requires directional drilling from the downstream slope of the embankment due to the depth below the crest. The contractor providing buildability advice has expressed serious reservations in respect of the construction approach and potential safety risks. Operational Phase: access for operation and maintenance is considered safe, with no confined space entries. This option eliminates the existing access hazards associated with operating valves in the draw-off tower.
Public Safety	No new hazards are introduced. Valves will be protected by locked covers to prevent malicious operation. Exposed pipework will be ductile iron and therefore not prone to being vandalised.
Maintenance	The only maintenance required will be servicing of valves, say every 10 years, unless upon testing immediate maintenance is deemed necessary. Access to the siphon is considered safe for this activity.
Operation & Testing	Operation of the siphon can be made safe with valves located within the chamber on the upstream face of the embankment, and at the downstream discharge point, and operated from above. The valves spindles can be protected with secure lockable covers.

Aspect	Assessment
	Testing would be minimal with twice yearly operation of the valves to confirm satisfactory operation of the siphon.

5.4 Option 3: Refurbish Existing Left Abutment Outlet

This option proposes the modification of the existing by-wash chamber to a gravity draw-off system as was described in the previous TFN (see also Figure 5-4 below). Preliminary hydraulic calculations show that this facility is likely to provide the required initial rate of 5% of H per day. However, this facility can only provide drawdown up to about 20% of H. The additional work that would be required in order for this arrangement to meet the criteria is anticipated to be disproportionately costly as it would require installation of pipes extending to a lower level into the reservoir with major alterations to the by-wash chamber.

It is noted that this option allows time for mobile pumps to be brought to site to allow facilitation of the remaining draw-off (if required).

The performance in relation to the criteria is shown in Table 5-6.

Table 5-6: Summary of Option 3 in terms of design criteria

Drawdown Criterion	Equivalent Value	Basis of criterion (see notes)	Option meets criterion [indicative marginal cost for meeting criterion]
Base cost estimate of suggested option: £140,000			
Initial Rate: 5% of H	0.35m/day	S10 and Guide	Yes [None]
30% of H in 14 days	2.1m	S10	No* [Disproportionally high]
33% of H in 7 days	2.33m	Guide	No* [Disproportionally high]
<p>Notes:</p> <p>S10 = rate required to comply with recommendation made in the interests of safety</p> <p>Guide = rate required to achieve target under new guidance</p> <p>* Rate/depth required to meet this criterion can be provided by mobile pumps brought to site</p>			

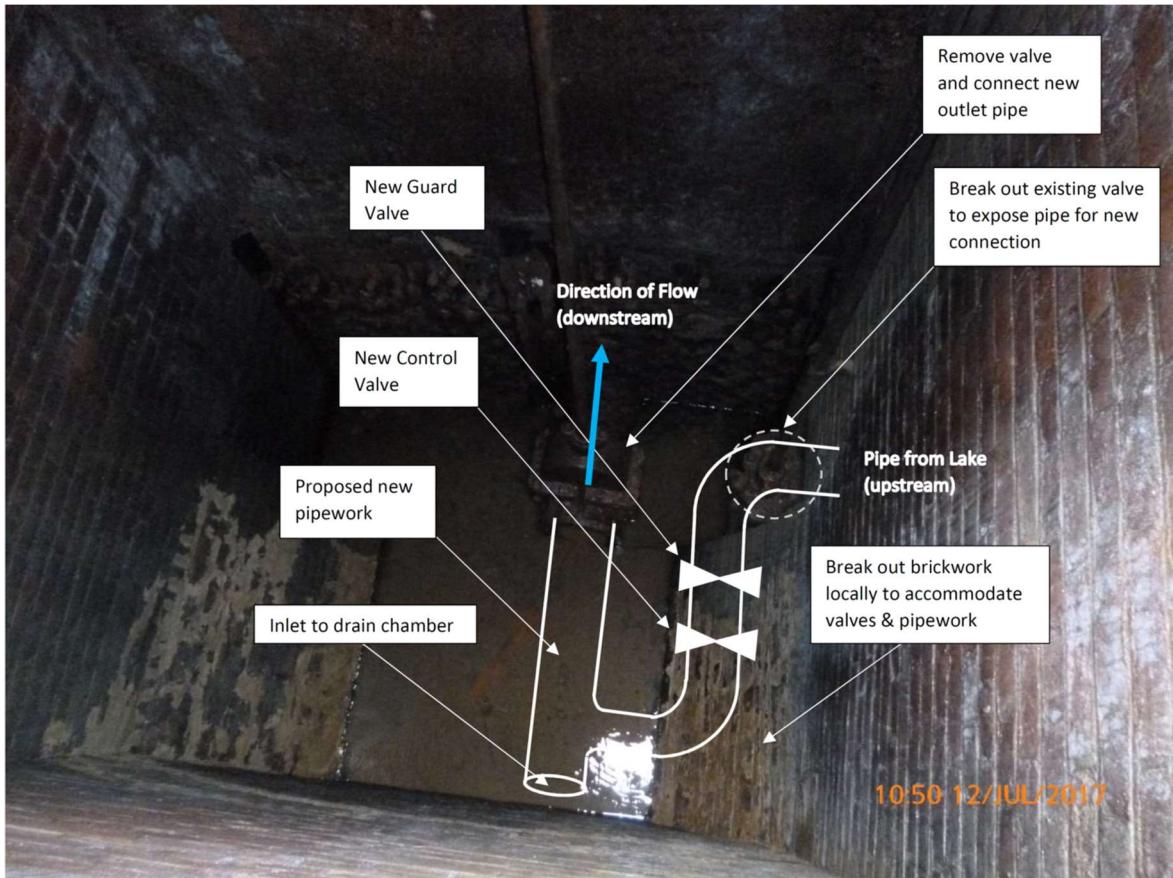
It is therefore concluded that this option would not meet the requirements of the section 10 recommendation in the interests of safety from 2017, and in which case would not satisfy the requirements of the Reservoirs Act 1975.

Table 5-7 provides a review of Option 3 in light of the factors listed in Section 4.2.

Table 5-7: Assessment of Option 3

Aspect	Assessment
Health & Safety	Construction Phase: Due to the confined conditions within the left abutment by-wash chamber, the work involved here poses a high risk. Total closure of the footpath is anticipated and possible deep excavation along the outer face of the chamber pose further construction risks. Operational Phase: valve spindles can be accessed and operating from a safe location on the dam crest, as at present. However, all maintenance would require confined space access into the by-wash chamber.
Public Safety	No new hazards are introduced. Valves will be protected by locked covers to prevent malicious operation.
Maintenance	The only maintenance required will be servicing of valves, say every 10 years, unless upon testing immediate maintenance is deemed necessary. Access to the valves in the by-wash chamber will involve possible hazards such as working in a confined space.
Operation & Testing	Operation of the by-wash facility can be made safe with valves operated from above. The valves spindles can be protected with secure lockable covers. Testing would be minimal with twice yearly operation of the valves to confirm satisfactory operation of the valves within the by-wash chamber.

Figure 5-3: Left abutment by-wash facility modification (ref previous TFN)



5.5 Possible additional works: Refurbish Draw-off Tower

It is noted that this option is not considered appropriate as an emergency draw-off facility and would not be accepted in terms of reservoir safety, and thus would not satisfy the recommendations made in the interests of safety in the 2017 section 10 report. This option has been included here for reference in the event that Hastings BC decide to improve access to this facility in the future, for instance by the provision of a new bridge. Significant resilience in terms of draw-down capacity would be provided if such a decision is taken.

The current draw-off pipes in the tower provide draw-down up to 26.05m AOD and this results in 29% of reservoir depth (H). A prudent option would be to replace the seized 9-inch valve located at 24.62m AOD within the tower which would allow draw-down of the reservoir up to this level (amounting to 49% of H). Although the construction requirements for this option are anticipated to be challenging (i.e. potential confined space operations & working over deep water), the associated costs are not excessive.

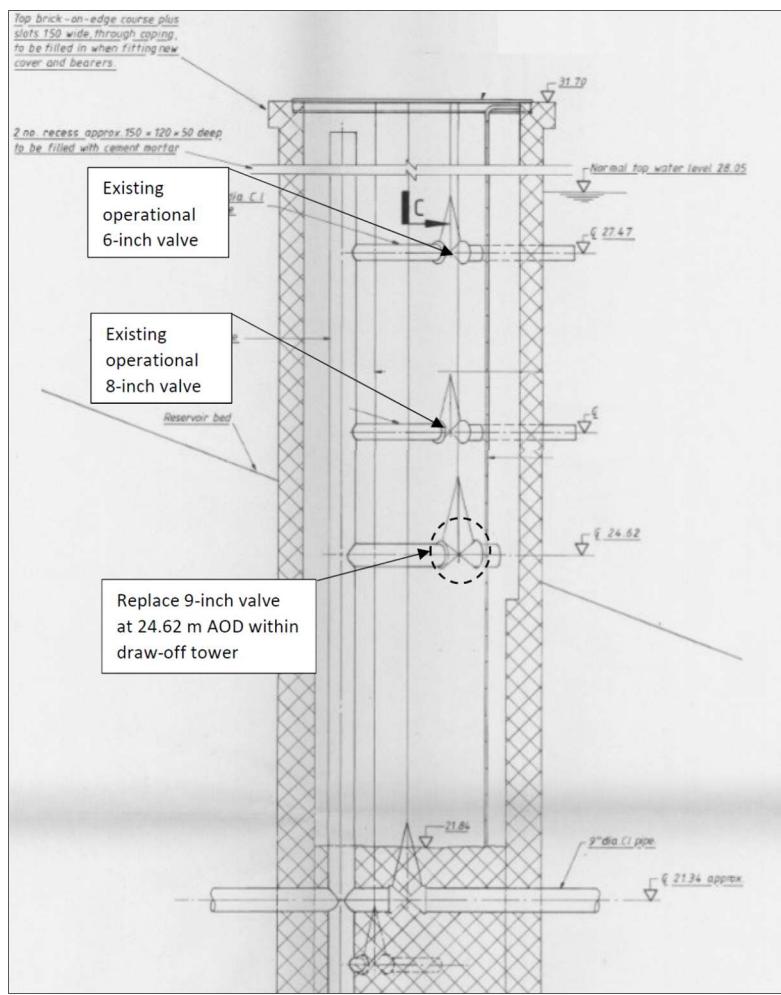
For the purposes of this study it has been assumed that the replacement valve work would be procured from a contractor without the need for design or supervision during construction. The construction cost only of the works required to replace the valve and pipework at 24.62m AOD is estimated as **£50,000.00**.

The performance in relation to the criteria is shown in Table 5-8. Figure 5-4 shows the existing functional valves in the draw-off tower and the valve at 24.62m AOD which is proposed to be replaced as part of this option.

Table 5-8: Summary of Option 4 in terms of design criteria

Drawdown Criterion	Equivalent Value	Basis of criterion (see notes)	Option meets criterion [indicative marginal cost for meeting criterion]
Base cost estimate of suggested option: £50,000*			
Initial Rate: 5% of H	0.35m/day	S10 and Guide	Yes [None]
30% of H in 14 days	2.1m	S10	Yes [None]
33% of H in 7 days	2.33m	Guide	Yes [None]
<p>Notes:</p> <p>S10 = rate required to comply with recommendation made in the interests of safety</p> <p>Guide = rate required to achieve target under new guidance</p> <p>*Cost of construction only and does not include any design or supervision fees</p>			

Figure 5-4: Layout of valves in the draw-off tower



6 Implications for Existing Drawdown Facilities

6.1 By-wash Chamber Outlet Pipe (left bank)

The existing draw-off facility on the left bank incorporates a valved outlet pipe into the left-bank by-wash chamber. The valve serving this pipe, which is located in the by-wash chamber, is seized closed and appears not to be letting by. The chamber is free-draining to the downstream by-wash channel, and must be retained as it receives surface water drainage from adjacent roads.

A number of options are available once the new drawdown facility has been implemented. The “do minimum” option (option ii) would be acceptable. In all cases ongoing future inspections of the by-wash chamber will be required to ensure reservoir safety.

Table 6-1: Summary of Options for Left Bank Outlet Pipe

Option	Description	Maintenance/Testing Requirements
i.	“Do nothing” option not acceptable: ongoing inspections of the by-wash chamber will be required to ensure reservoir safety.	
ii.	“Do minimum”: Retain and abandon. Valve is seized closed and not letting by.	Annual check from surface. Internal inspection of by-wash chamber and valves at 10-yearly inspections. Only carry out works if valve begins to let by.
iii.	Retain, abandon and install blanking plate on valve before next s10 inspection (2026).	Annual check from surface. Internal inspection of by-wash chamber and valves at 10-yearly inspections.
iv.	Retain, abandon. Install drain plug at upstream end of outlet pipe when reservoir drawn down for implementing siphon (Option 1) works. Consider grouting pipe as part of this work	Annual check from surface. By-wash chamber will need to be inspected internally at 10-yearly inspections. Check that no seepage is occurring from pipe.
v.	Remove valve and grout pipe.	Annual check from surface. By-wash chamber will need to be inspected internally at 10-yearly inspections. Check that no seepage is occurring from pipe.

6.2 Draw-off Tower Outlet Valves

The draw-off tower contains two operational draw-off valves at different levels. The tower has been accessed regularly over a number of years and is currently in a satisfactory condition. The two draw-off valves operate satisfactorily.

Once the siphon (Option 1) has been implemented there will be no requirement to retain these valves from a reservoir safety point of view. HBC may, however, decide that the valves should be retained for future operation, and as providing redundancy for draw-down.

A number of options are available once the new drawdown facility has been implemented. The “do minimum” option (option ii) would be acceptable, noting that ongoing surveillance and inspections will be required if the draw-off tower is retained, to ensure reservoir safety.

Table 6-2: Summary of Options for Draw-off Tower

Option	Description	Maintenance/Testing Requirements
i.	"Do nothing" option not acceptable: ongoing inspections of the draw-off tower chamber will be required to ensure reservoir safety.	
ii.	"Do minimum": Retain, abandon. The valves would become inoperable over time.	Tower and valves would be accessed and checked annually as part of surveillance (Supervising Engineer visits). Tower and valves would be accessed and inspected as part of the 10-yearly inspection. Only carry out works if valves begin to let by, or if tower condition deteriorates to an unacceptable level.
iii.	Retain for ongoing operational use. The two operational valves are currently in a satisfactory condition.	Regular testing would be required to ensure long-term satisfactory operation. Tower and valves would be accessed and checked annually as part of surveillance (Supervising Engineer visits). Tower and valves would be accessed and inspected as part of the 10-yearly inspection.
iv.	Abandon and seal, for instance with blanking plate installed at upstream end of outlet pipes. This operation would require divers.	Tower would be accessed and checked annually as part of surveillance (Supervising Engineer visits). Tower would be accessed and inspected as part of the 10-yearly inspection.
v	Grout outlet pipe through embankment.	Downstream end of pipe would be monitored for seepage. Tower would be accessed and checked annually as part of surveillance (Supervising Engineer visits). Tower would be accessed and inspected as part of the section 10-yearly inspection.
vi.	Grout outlet pipe through embankment and demolish tower.	Downstream end of pipe would be monitored for seepage.

7 Conclusions & Recommendations

7.1 General

Preliminary hydraulic assessments have been made for all options, including option variants to indicate how the target capacity can be achieved in line with the new drawdown guidance.

The options have been costed in consultation with C J Thorne civil engineering contractors, who have first-hand knowledge of the site and the existing draw-down and overflow facilities. The cost estimates are limited to civil engineering works and it should be noted that costs related to environmental aspects such as environmental surveys and fish rescue, have not been considered. In addition to the anticipated construction costs allowances are included for design and management fees, health & safety, Principal Designer (CDM) fees, construction supervision, QCE fees and contingencies.

For each option the costings are included in Appendix B.

7.2 Reservoir lowering

For ease of construction, minimising construction cost for the preferred siphon option (Option 1), it would be necessary to lower the reservoir by at least 4.05m to 24m AOD to allow installation of pipework down the upstream face of the dam. This represents a volume of around 57,000m³, which in normal weather would take roughly 2 to 4 months to refill on completion of the works. It is understood that this approach is likely to have an unacceptable impact in terms of the fish habitat.

An alternative approach, therefore, would be to lower the lake level by approximately 1m only for construction. This would allow the coring of the weir wall for the installation of the siphon pipe through the overflow structure. The upstream section of siphon pipe would need to be constructed by floating the pipe on to the lake and sinking it into position. This would be a more complex, although practical option. It might be necessary to employ divers to direct and assist in this activity to ensure a satisfactory installation. An additional budget allowance of £10k for this activity has been included in the option cost (Options 1 and 2) in this report.

The preferred time of year to execute the works would be late summer to autumn months (i.e. August - October). The drier summer months would imply a lower expected reservoir level and smaller average expected inflows into the reservoir (both factors contributing to less volume being required to pump from the reservoir in preparation of the works). On completion of the works the rainy season would fast be approaching which would imply that the reservoir can fill more rapidly than in the summer.

Provision has been made for the cost of over pumping, but no allowance has been made for any other costs such as environmental surveys and fish rescue etc. as stated in 6.1 above.

7.3 Summary

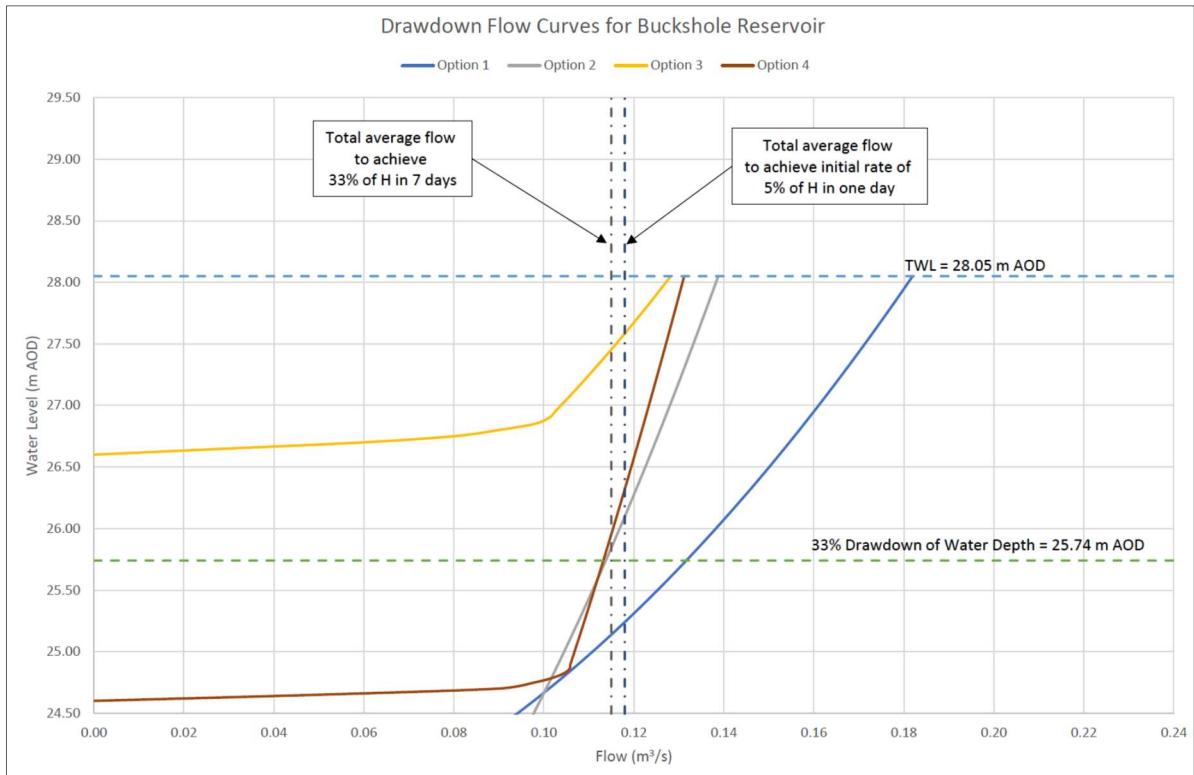
Stillwater Associates were commissioned to identify and develop viable options for Hastings BC for a suitable new emergency drawdown facility at their Buckhole Reservoir located in Hastings. A short TFN preceded this report, with high-level options identified at that stage that were assessed to identify a short list of viable options. This report provides a detailed and final evaluation of the short-listed viable options, with a recommended preferred option.

The viable options have been developed in greater detail with key dimensions in Table 7-1, and flow capacity vs reservoir level in Figure 7-1.

Table 7-1: Key dimensions of options for drawdown capacity

Option	Pipe Inside Diameter	Upstream Invert (m AOD)	Downstream Invert (m AOD)
1	300mm	25	24.7
2	250mm	24.72	21
3	250mm entering by-pass chamber from reservoir & 300mm exiting by-pass chamber to the downstream channel	26.64	25
4	6-inch (upper intake) 8-inch (lower intake) 9-inch (seized valve possibly to be replaced) 9-inch (outlet pipe from draw-off tower through embankment at a low level)	27.47 (upper intake) 26.05 (lower intake) 24.62 (seized valve possibly to be replaced)	19.5

Figure 7-1 Flow capacity vs reservoir level



A description of each option was presented in Section 5, with a comparison of key aspects of the schemes in Table 7-2 below.

Table 7-2: Comparison of options

Option Ref	Option 1	Option 2	Option 3	Option 4
Summary Description	Siphon through right abutment spillway	Siphon through embankment	Refurbish existing left abutment	Refurbish tower
Meet the requirements of the Reservoirs Act 1975	Y	Y	N	N
Estimated cost	£150,000	£300,000	£140,000	£50,000
Initial rate of 5% of reservoir depth per day	Y	Y	Y	Y
Draw-down to 33% of reservoir depth in 7 days	Y	Y	N	Y
Minimum draw-down level (m AOD)	25.0	24.7	26.9	24.62
Ease of maintenance [relative cost]	Good [Low cost]	Good [Low cost]	Confined space [Medium cost]	Access by boat; confined space [Medium cost]
Indicative impact on trees (low, medium or high)	Low	Low	Low	Low

In principle Option 3 and Option 4 do not meet the requirements of the Reservoirs Act 1975 since they would not satisfy the recommendations in the interests of safety contained in the section 10 report from 2017. These options are therefore rejected. Hastings BC may wish to refurbish the tower (Option 4) to provide improved operational flexibility.

Further, Option 3 would involve considerable construction complexities, and present significant future maintenance difficulties, including hazards associated with confined space access.

Both the remaining options, Options 1 and 2, meet the drawdown criteria. In terms of costs Option 1 clearly is the preferred option.

It is noted that separate works to the spillway chute are likely to be procured in the near future to satisfy another mandatory recommendation in the interests of safety. Although Option 1 (siphon through spillway structure) could be procured as a separate contract, it is likely to be cheaper if procured in conjunction with the spillway chute improvement works, and this would also provide greater flexibility in detailing of the downstream valve chamber and any stilling sump. It is therefore recommended that a decision on the procurement of Option 1 is deferred until the extent of works required to increase spillway capacity is fully defined.

7.4 Recommended Option

Hastings BC has requested Stillwater Associates to propose “*a single preferred draw down option for bankside array*”. Option 1, incorporating a low-level siphon through the overflow structure, is the recommended preferred option since it provides the full target drawdown capacity in line with the recently published Environment Agency guidance on reservoir emergency drawdown, as well as satisfying the Inspecting Engineer’s statutory recommendation in the interests of safety.

This option eliminates or minimises safety hazards at construction stage, and eliminates existing hazards associated with the current operation and maintenance of valves in the draw-off tower for drawing down the reservoir. This option does not present any new hazards in respect of public safety.

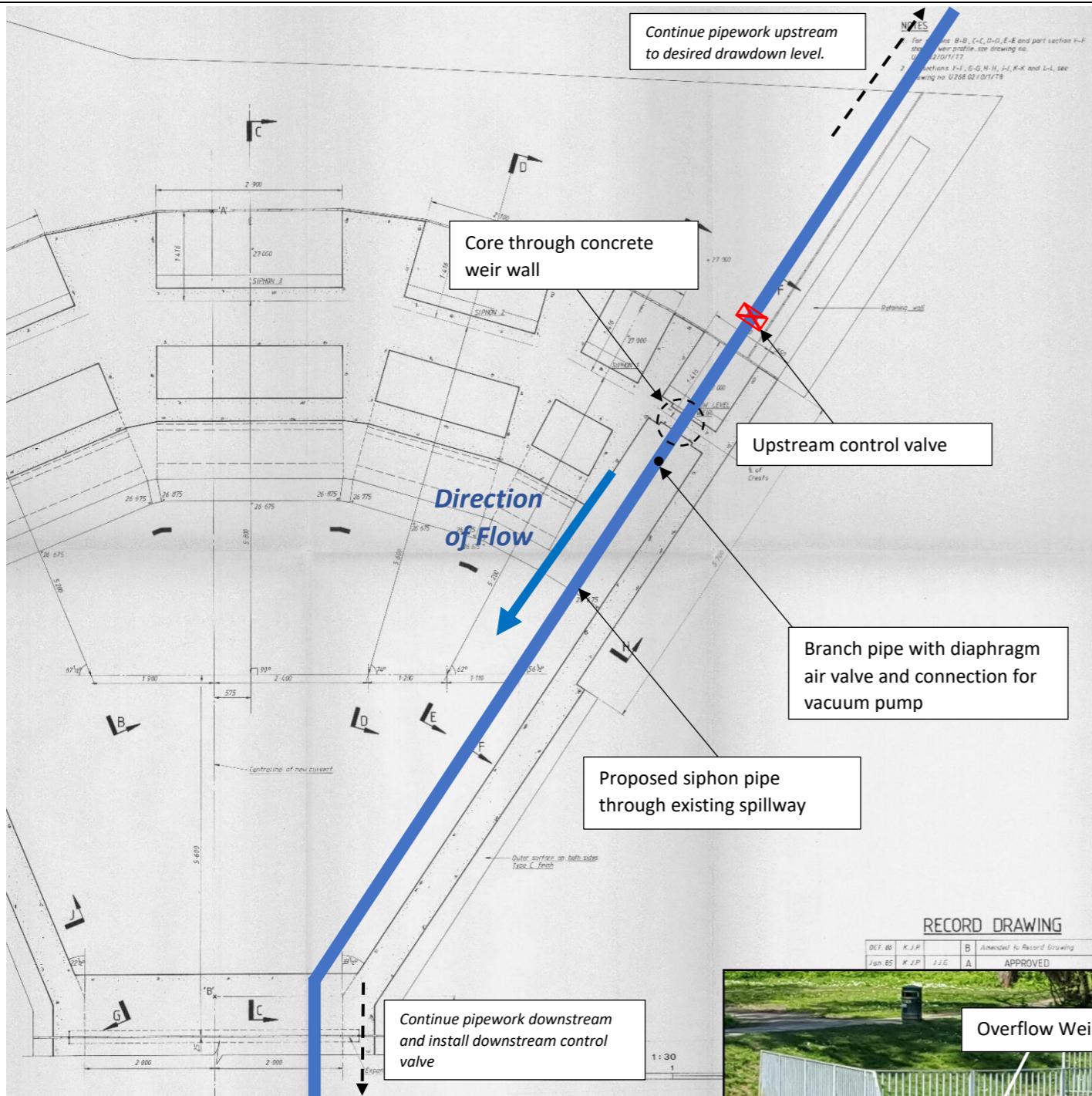
Compared to other options this option will require the least maintenance, limited to servicing valves at intervals of, say, every 10 years.

The estimated out-turn cost is £150,000 (excl. VAT), including all anticipated fees for developing the scheme through detailed design and implementation on site, and includes an allowance for implementing the works without a significant drawdown of the reservoir. This cost does not include Hastings BC internal costs.

8 References

- Stillwater Associates Technical File Note (TFN), Options Appraisal for New Draw-down Facility, 24th March 2017
- Brown, A.J. 2017. Buckhole Reservoir: Report on an Inspection under Section 10 of the Reservoirs Act 1975. Hastings Borough Council, Queens Road, Hastings, East Sussex, TN34 1QR.
- Environment Agency. 2017. *Guide to drawdown capacity for reservoir safety and emergency planning*. (SC130001 Volume 1 – main guide). Environment Agency, Horizon House, Deanery Road, Bristol, BS1 9AH.

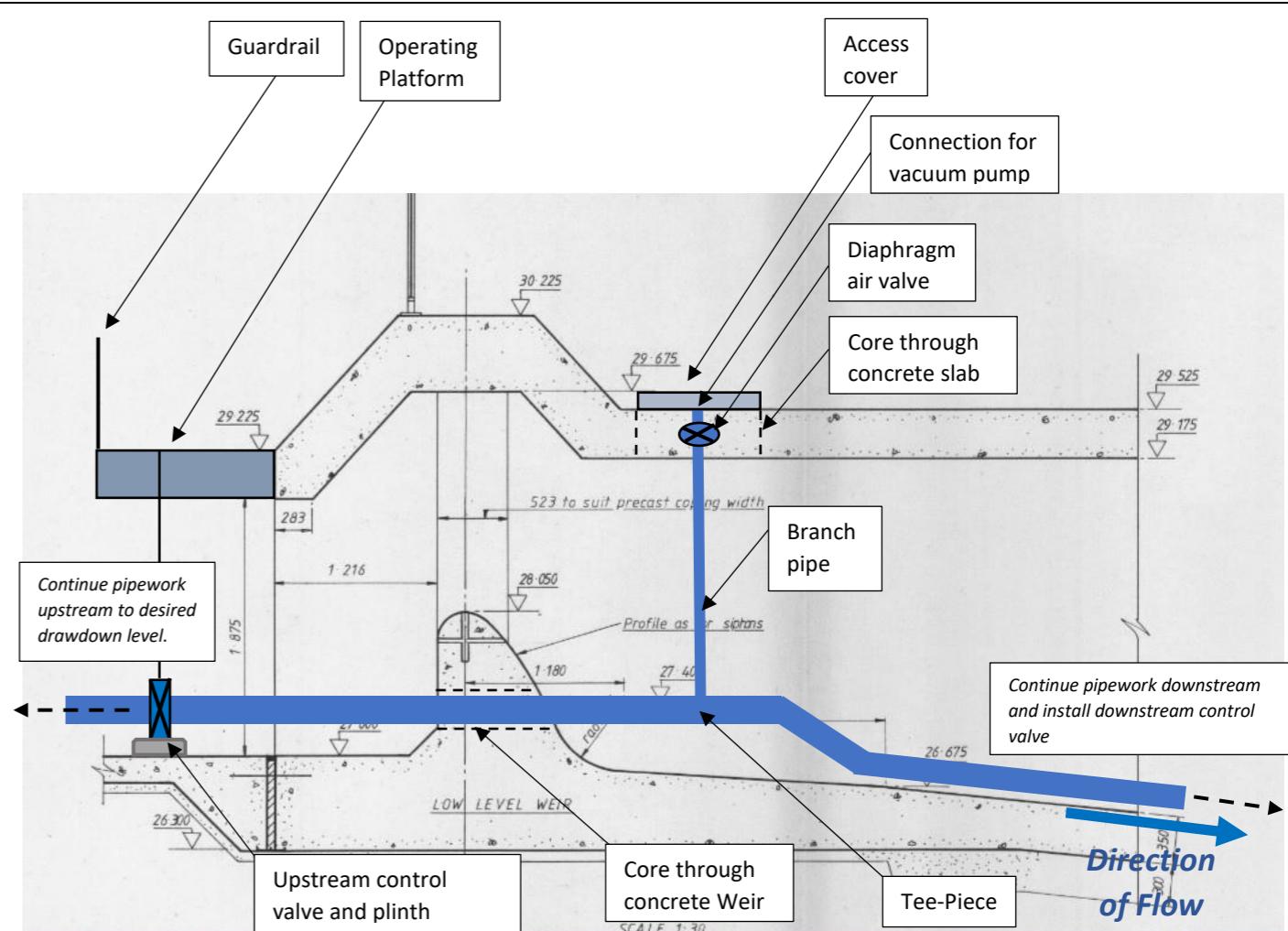
Appendix A Conceptual Sketches of the Options



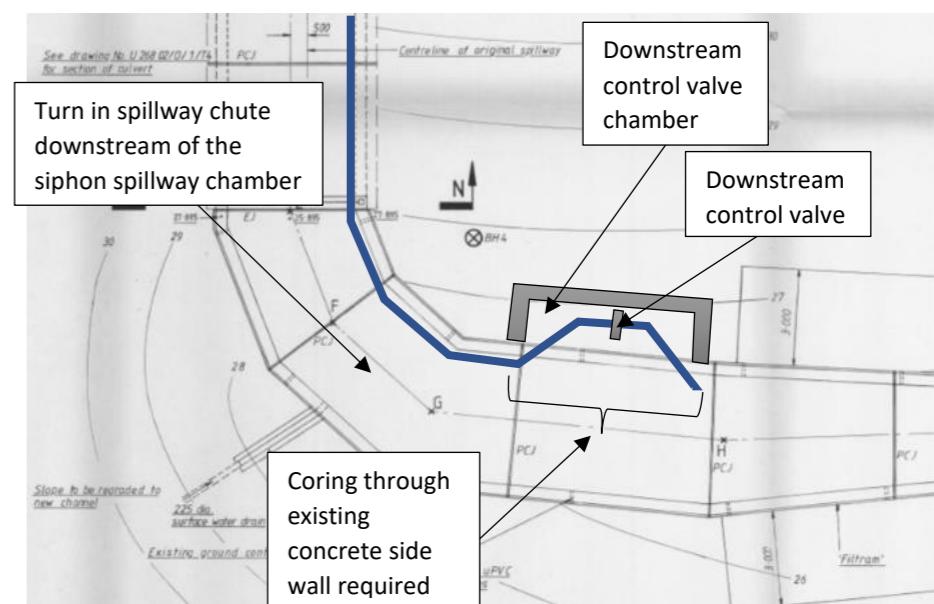
Plan showing new siphon pipework through overflow weir wall

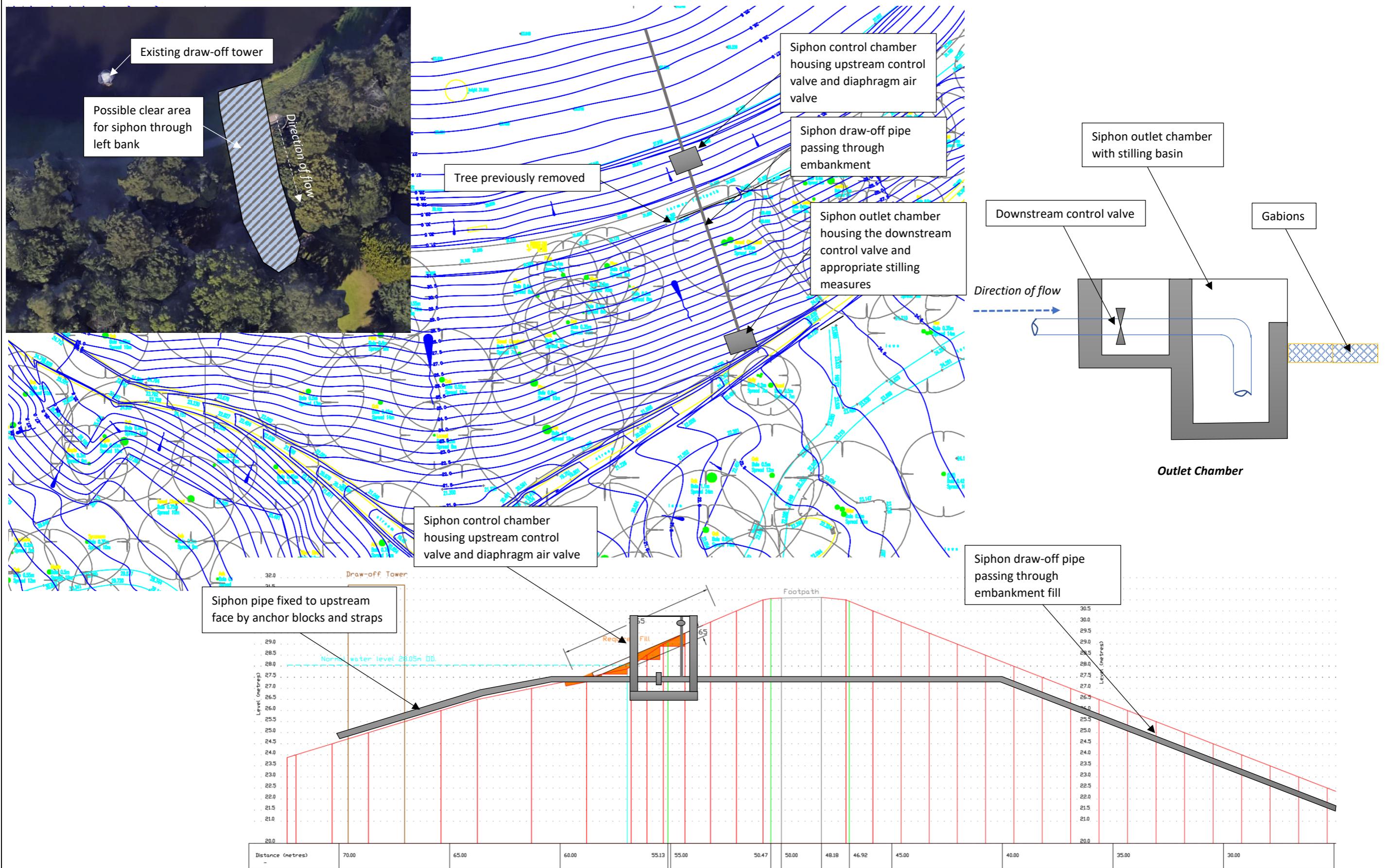


Notes: Not drawn to scale.

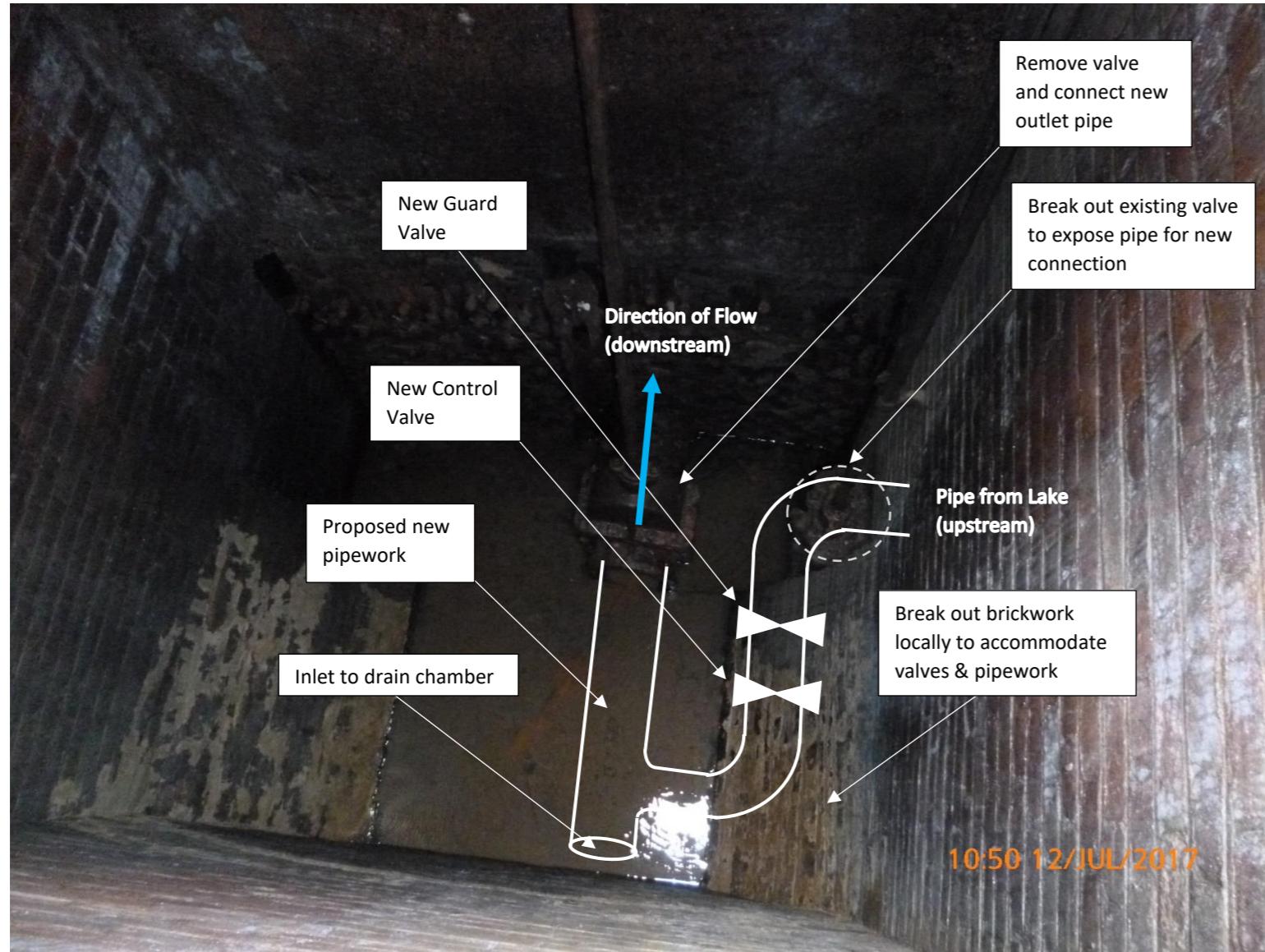


Section through proposed new siphon pipework through weir wall





Notes: Not drawn to scale.



Proposed replacement valves and new outlet pipework within left bank bypass chamber



Notes: Not drawn to scale.

Appendix B Costing of Options

Option 1: Siphon through overflow structure

6	Weeks Duration				
<i>Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Rate</i>	<i>Amount</i>
A1	Prelims	Week	6	£3,300.00	£19,800.00
A2	355mm Dia MDPE Pipes - 24m	Sum	1	£4,238.00	£4,238.00
A3	Core Drill	Sum	1	£1,628.00	£1,628.00
A4	New Steps and Platform	Sum	1	£3,469.00	£3,469.00
A5	Concrete Pedestals x 3	Sum	1	£723.00	£723.00
A6	Access Cover	Sum	1	£1,713.00	£1,713.00
A7	Over-pumping	Sum	1	£4,309.00	£4,309.00
A8	Labour & plant	Sum	1	£16,837.00	£16,837.00
A9	Handrail	Sum	1	£634.00	£633.00
A10	300mm DI Pipes - 56m	Sum	1	£17,600.00	£17,600.00
A11	PCC Pipe Collars	Sum	1	£7,350.00	£7,350.00
A99	Allowance for divers	Sum	1	£9,000.00	£9,000.00
Sub-Total A					£87,300.00
B1	Contingencies	%	30	£87,300.00	£26,190.00
Sub-Total B					£26,190.00
C1	Design & Management Fees	%	15	£113,490.00	£17,023.50
C2	Principal Designer	Hours	56	£65.00	£3,640.00
C3	Site Supervision	Hours	168	£65.00	£10,920.00
C4	QCE	Hours	40	£85.00	£3,400.00
C5	Expenses	Sum	1	£600.00	£600.00
Sub-Total C					£35,583.50
Grand Total					£149,073.50
Grand Total (Rounded)					£150,000.00

Option 2: Siphon through embankment

Note: Option 2 was costed previously in consultation with CJ Thorne as described in a Stillwater Associates TFN dated 24th March 2017 and titled *Options Appraisal for new Draw-down Facility*. No further costing was carried out for the purpose of this study.

<i>Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Rate</i>	<i>Amount</i>
	CJ Thorne Budget Estimate [e-mail of 22-Mar-17]				£160,000.00
	Allowance for divers	Sum	1	£9,000.00	£9,000.00
	Budget estimate of addition of actuated valves				£21,000.00
	Sub-Total A				£190,000.00
B1	Contingencies	%	30	£190,000.00	£57,000.00
	Sub-Total B				£57,000.00
C1	Design & Management Fees	%	15	£247,000.00	£37,050.00
C2	Design & Management Fees, Principal Designer, Supervision, QCE, Expenses				£20,000.00
	Sub-Total C				£57,050.00
	Grand Total [rounded]				£300,000.00

Option 3: Install gravity system in left bank by-wash chamber

8	Weeks Duration
---	----------------

<i>Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Rate</i>	<i>Amount</i>
A1	Prelims	Week	8	£3,250.00	£26,000.00
A2	Over-pumping	Sum	1	£4,309.00	£4,309.00
A3	Labour & Plant	Sum	1	£18,703.00	£18,703.00
A6	Ground Support	Sum	1	£3,848.00	£3,848.00
A7	Pipework	Sum	1	£8,117.00	£8,117.00
A8	Core-drilling	Sum	1	£526.00	£526.00
A9	Technocover	Sum	1	£15,000.00	£15,000.00
Sub-Total A					£76,503.00
B1	Contingencies	%	30	£76,503.00	£22,950.90
Sub-Total B					£22,950.90
C1	Design & Management Fees	%	15	£99,453.90	£14,918.09
C2	Principal Designer	Hours	64	£65.00	£4,160.00
C3	Site Supervision	Hours	224	£65.00	£14,560.00
C4	QCE	Hours	40	£85.00	£3,400.00
C5	Expenses	Sum	1	£800.00	£800.00
Sub-Total C					£37,838.09
Grand Total					£137,291.99
Grand Total (Rounded)					£140,000.00

Option 4: Draw-off tower refurbishment

3	Weeks Duration
---	----------------

<i>Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Rate</i>	<i>Amount</i>
A1	Prelims	Week	3	£3,250.00	£9,750.00
A7	Over-pumping	Sum	1	£4,309.00	£4,309.00
A8	Labour & plant	Sum	1	£16,680.00	£16,680.00
A9	Tower Pipework	Sum	1	£2,036.00	£2,036.00
A10	Tower Flooring	Sum	1	£4,467.00	£4,467.00
Sub-Total A					£37,242.00
B1	Contingencies	%	30	£37,242.00	£11,172.60
Sub-Total B					£11,172.60
C1	Design & Management Fees	%	0	£48,414.60	£0.00
C2	Principal Designer	Hours	0	£65.00	£0.00
C3	Site Supervision	Hours	0	£65.00	£0.00
C4	QCE	Hours	0	£85.00	£0.00
C5	Expenses	Sum	0	£300.00	£0.00
Sub-Total C					£0.00
Grand Total					£48,414.60
Grand Total (Rounded)					£50,000.00

Appendix C HAZOP Assessment

Project no: SE108
Project name: Buckhole Reservoir: Drawdown Options Assessment
Document ref: SE108_BCH_DRA_001
Date: 01-Jul-18

Risk Analysis Table

 Stillwater Associates
Reservoir Safety & Water Consultancy

Revision: 1

Ref	Topic or Design Element	Associated Hazards	Can hazard be eliminated?	Mitigation of risk at design stage	Residual Risk					Method of controlling risk	Risk Owner/Action By							
					Work is at Risk*	Probability of hazard (P)	Severity of hazard (S)	Risk P x S										
Risk Analysis for Option 1																		
Demolition																		
D1	<u>Accessing inside of overflow structure</u>	Possible confined space - access constraints	No	None	S	3	3	9	Install appropriate means of access/egress	Contractor								
D2	<u>Coring through weir wall</u>	Working within a confined space	No	The choice of option means limited working within the overflow structure, and the space in question can most readily be made safe as part of working methods.	S	3	3	9	Ensure appropriate measures are in place such as forced air ventilation, if deemed necessary	Contractor								
Construction																		
C1	<u>Access on to dam crest</u>	Interaction of plant and construction workers and general public	No	None - alternative access routes have been investigated - the most appropriate access is from the left bank	S/G	3	3	9	Careful planning prior to mobilisation and good management of construction traffic, including personnel arriving at site and leaving site each day	Contractor								
C2	<u>Underground services</u>	Striking buried services	No	Up to date service plans have been obtained and a visual survey of the site undertaken to check for private services.	S	2	5	10	Contractor to undertake searches prior to commencing works and prior to breaking ground for each activity.	Contractor								
C3	<u>Traffic management on site</u>	Traffic incidents on site - personnel or works struck by plant	No	Limited vehicle movements are envisaged due to the nature of the works.	S	2	5	10	Site traffic management plan to be prepared. Consider segregation of walking routes and construction vehicle routes/working areas.	Contractor								
C4	<u>Working on steep embankment slope</u>	Slips, trips, falls	No	None	S	2	5	10	Careful planning and appropriate means of temporary access, and clearly defined access routes.	Contractor								
C5	<u>Soft Ground and vehicles/plant/cranes/excavators</u>	Construction in and around dam crest and adjacent to watercourse; ground conditions are generally poor - risk of plant or vehicles overturning	No	None - contractor will require plant to operate on site for implementation of works.	S	2	5	10	Careful planning of works and selection of correct plant for activities/ground conditions	Contractor								
C6	<u>Lifting operations</u>	Crane over-turning.	No	None	S	2	5	10	Contractor to provide method statement & appropriately trained staff/banksman. Prepare lifting plan. Ensure crane platforms have been correctly assessed.	Contractor								
C7	<u>Working near/adjacent to/over water</u>	Risk of drowning	No	None - the works are adjacent to deep and/or fast flowing water.	S/G	3	5	15	Ensure works are appropriately segregated and edge protection in place. Provide appropriate PPE for activities adjacent to or in water.	Contractor								
C8	<u>Flooding</u>	Floods during construction posing risk of pollution, drowning. In worse case leading to catastrophic breach of existing dam with risk to downstream population	No	None - the works are associated with an impounding reservoir	S/G	1	5	5	Construction work not to take place if abnormal rainfall occurs or it is expected that the dam is insufficient to contain the reservoir. This judgement is to be made by a competent person on site. And CCE.	Contractor								
C9	<u>Waterborne/water environment diseases</u>	Weils disease	No	None - the works are adjacent to and within natural watercourses where this hazard may be present.	S	2	5	10	Regular briefings of site staff, ensuring all are aware of the need for good hygiene and aware of the symptoms.	Contractor								
Operation & Maintenance: See separate Hazop Analysis																		
Environment																		
E1	<u>Use of Raw Materials</u>	Sustainability	No	Sustainable sources of raw materials and maximisation of recycled materials. Sheet piles carefully designed to minimise length	E	2	3	6	Design has controlled risk. There may be further opportunities at construction stage to select more sustainable materials for temporary works.	Contractor								
E2	<u>Noise</u>	Noise impact on habitats and local residents	No	Working hours will be limited. Weekend working will not normally be permitted.	E	2	3	6	Careful planning and selection of construction plant.	Contractor								
E3	<u>Pollution of watercourses from oils/leaks, COSHH Substances, fuel etc</u>	Pollution of watercourse and impact on in-channel and out-of-channel habitats and species	No	Hazardous materials avoided in design where possible, although there is extensive use of concrete poured in-situ.	E	3	5	15	Design has controlled risk. Contractor to ensure measures in place to prevent pollution incidents, including provision of catch trays, spill kits and other suitable measures.	Contractor								
E4	<u>Specific risk of pollution of watercourses with cement</u>	Pollution of watercourse and impact on in-channel and out-of-channel habitats and species	No	Design has considered alternative materials. Concrete is the most suitable material for the proposed works.	E	3	4	12	Contractor must ensure all concreting or grouting works are undertaken with particular care in vicinity of watercourses or water bodies.	Contractor								
E5	<u>Sediment run-off into watercourse</u>	Run-off from exposed clay/dredged silt into watercourse	No	None	E	3	4	12	Careful planning/sequencing of works and provision of silt traps and other appropriate measures. Isolate works from watercourses where possible. Refer to relevant guidance, eg Environment Agency PPG publications.	Contractor								
E5	<u>Invasive plants/species</u>	No invasive species currently identified as being present	No	n/a	E	2	4	8	Further checks to be carried out in advance of works so that control measures can be put in place if necessary	Client								
E6	<u>Ecology: Habitat Regs</u>	General risk to wildlife, fauna, flora, habitats	No	Siphon option poses minimal risk as works are primarily within existing structures	E	1	4	4	Further checks to be carried out in advance of works so that control measures can be put in place if necessary	Client								
E7	<u>Dust</u>	Dust affecting habitats	No	The proposed works minimise the need to disturb existing structures	E	1	3	3	Assess activities at time of construction to determine if further controls are needed.	Contractor								
* S - Site Workers G - General Public E - Environment																		
Interpretation of Risk Assessment		Probability 1 = Improbable Occurrence? 2 = Infrequent? 3 = Several times a year? 4 = Monthly? 5 = Weekly?			Severity: Health & Safety 1 = No First Aid Required 2 = First Aid Only Required 3 = 3 Day Injury as defined in RIDDOR 4 = Serious Injury as defined by RIDDOR 5 = Fatality			Severity: Environment 1 = No discernible impact 2 = Minor and temporary impact 3 = Moderate environmental impact, no pollution 4 = Significant environmental incident and impact on habitat 5 = Major environmental incident and loss of habitat			Risk - (Probability x Severity) Minimal Risk = 1 - 5 Tolerable Risk = 6 - 10 Moderate Risk = 11 - 15 Substantial Risk = 16 - 20 Intolerable Risk = 21 - 25							

Risk Analysis Table

Revision: 1

Ref	Topic or Design Element	Associated Hazards	Can hazard be eliminated?	Mitigation of risk at design stage	Residual Risk				Method of controlling risk	Risk Owner/Action By						
					Who is at risk?	Probability of hazard (P) 1 - 5	Severity of hazard (S) 1 - 5	Risk (P x S) 1 - 25								
Risk Analysis for Option 2																
Demolition																
D1	No demolition															
Construction																
C1	<u>Access on to dam crest</u>	Interaction of plant and construction workers and general public	No	None - alternative access routes have been investigated - the most appropriate access is from the left bank	S/G	3	3	9	Careful planning prior to mobilisation and good management of construction traffic, including personnel arriving at site and leaving site each day	Contractor						
C2	<u>Underground services</u>	Striking buried services	No	Up to date service plans have been obtained and a visual survey of the site undertaken to check for private services.	S	2	5	10	Contractor to undertake searches prior to commencing works and prior to breaking ground for each activity.	Contractor						
C3	<u>Traffic management on site</u>	Traffic incidents on site - personnel or works struck by plant	No	Limited vehicle movements are envisaged due to the nature of the works.	S	2	5	10	Site traffic management plan to be prepared. Consider segregation of walking routes and construction vehicle routes/working areas.	Contractor						
C4	<u>Working on steep embankment slope - platform required for directional drilling</u>	Slips, trips, falls	No	None	S	2	5	10	Careful planning and appropriate means of temporary access, and clearly defined access routes.	Contractor						
C5	<u>Soft Ground and vehicles/plant/cranes/excavators</u>	Construction in and around dam crest and adjacent to watercourse: ground conditions are generally poor - risk of plant or vehicles overturning	No	None - contractor will require plant to operate on site for implementation of works.	S	2	5	10	Careful planning of works and selection of correct plant for activities/ground conditions	Contractor						
C6	<u>Lifting operations</u>	Crane over-turning.	No	None	S	2	5	10	Contractor to provide method statement & appropriately trained staff/banksman. Prepare lifting plan. Ensure crane platforms have been correctly assessed.	Contractor						
C7	<u>Working near/adjacent to/over water</u>	Risk of drowning	No	None - the works are adjacent to deep and/or fast flowing water.	S/G	3	5	15	Ensure works are appropriately segregated and edge protection in place. Provide appropriate PPE for activities adjacent to or in water.	Contractor						
C8	<u>Flooding</u>	Floods during construction posing risk of pollution, drowning. In worse case leading to catastrophic breach of existing dam with risk to downstream population	No	None - the works are associated with an impounding reservoir	S/G	1	5	5	Construction work not to take place if abnormal rainfall occurs or it is expected that the dam is insufficient to contain the reservoir. This judgement is to be made by a competent person on site. And QCE.	Contractor						
C9	<u>Waterborne/water environment diseases</u>	Weils disease	No	None - the works are adjacent to and within natural watercourses where this hazard may be present.	S	2	5	10	Regular briefings of site staff, ensuring all are aware of the need for good hygiene and aware of the symptoms.	Contractor						
Operation & Maintenance: See separate Hazop Analysis																
Environment																
E1	<u>Use of Raw Materials</u>	Sustainability	No	Sustainable sources of raw materials and maximisation of recycled materials. Sheet piles carefully designed to minimise length	E	2	3	6	Design has controlled risk. There may be further opportunities at construction stage to select more sustainable materials for temporary works.	Contractor						
E2	<u>Noise</u>	Noise impact on habitats and local residents	No	Working hours will be limited. Weekend working will not normally be permitted.	E	2	3	6	Careful planning and selection of construction plant.	Contractor						
E3	<u>Pollution of watercourses from oils/leaks, COSHH Substances, fuel etc</u>	Pollution of watercourse and impact on in-channel and out-of-channel habitats and species	No	Hazardous materials avoided in design where possible, although there is extensive use of concrete poured in-situ.	E	3	5	15	Design has controlled risk. Contractor to ensure measures in place to prevent pollution incidents, including provision of catch trays, spill kits and other suitable measures.	Contractor						
E4	<u>Specific risk of pollution of watercourses with cement</u>	Pollution of watercourse and impact on in-channel and out-of-channel habitats and species	No	Design has considered alternative materials. Concrete is the most suitable material for the proposed works.	E	3	4	12	Contractor must ensure all concreting or grouting works are undertaken with particular care in vicinity of watercourses or water bodies.	Contractor						
E5	<u>Sediment run-off into watercourse</u>	Run-off from exposed clay/dredged silt into watercourse	No	None	E	3	4	12	Careful planning/sequencing of works and provision of silt traps and other appropriate measures. Isolate works from watercourses where possible. Refer to relevant guidance, eg Environment Agency PPG publications.	Contractor						
E5	<u>Invasive plants/species</u>	No invasive species currently identified as being present	No	n/a	E	2	4	8	Further checks to be carried out in advance of works so that control measures can be put in place if necessary	Client						
E6	<u>Ecology: Habitat Regs</u>	General risk to wildlife, fauna, flora, habitats	No	Siphon option poses minimal risk as works are primarily within existing structures	E	1	4	4	Further checks to be carried out in advance of works so that control measures can be put in place if necessary	Client						
E7	<u>Dust</u>	Dust affecting habitats	No	The proposed works minimise the need to disturb existing structures	E	1	3	3	Assess activities at time of construction to determine if further controls are needed.	Contractor						
* S - Site Workers G - General Public E - Environment																
Interpretation of Risk Assessment	Probability 1 = Improbable Occurrence? 2 = Infrequent? 3 = Several times a year? 4 = Monthly? 5 = Weekly?			Severity: Health & Safety 1 = No First Aid Required 2 = First Aid Only Required 3 = 3 Day Injury as defined in RIDDOR 4 = Serious Injury as defined by RIDDOR 5 = Fatality		Severity: Environment 1 = No discernible impact 2 = Minor and temporary impact 3 = Moderate environmental impact, no pollution 4 = Significant environmental incident and impact on habitat 5 = Major environmental incident and loss of habitat		Risk - (Probability x Severity) Minimal Risk = 1 - 5 Tolerable Risk = 6 - 10 Moderate Risk = 11 - 15 Substantial Risk = 16 - 20 Intolerable Risk = 21 - 25								

Risk Analysis Table

Revision: 1

Ref	Topic or Design Element	Associated Hazards	Can hazard be eliminated?	Mitigation of risk at design stage	Residual Risk				Method of controlling risk	Risk Owner/Action By						
					Who is at risk?*	Probability of hazard (P) (S)	Severity of hazard (S)	Risk (P x S)								
Risk Analysis for Option 3																
Demolition																
D1	<u>Accessing inside of by-pass chamber</u>	Possible confined space - access constraints	No	None	S	4	4	16	Install appropriate means of access/egress	Contractor						
D2	<u>Coring through weir wall</u>	Working within a confined space	No	None	S	4	4	16	Ensure appropriate measures are in place such as forced air ventilation, if deemed necessary	Contractor						
D2	<u>Deep excavation on outside of by-pass chamber</u>	Working within a confined space and at height	Yes, but only with more complicated working within by-pass chamber	None	S	4	4	16	Install appropriate means of access/egress. Consider need for forced air ventilation	Contractor						
D3	<u>Accessing inside of draw-down tower</u>	Scaling tower with ladders, or scaffold access - working at height	No	None	S	3	4	12	Install appropriate means of access/egress	Contractor						
D4	<u>Coring through draw-down tower wall</u>	Working within a confined space	No	It will be necessary to work within the tower, even if coring is undertaken from outside, with reservoir drawn down	S	4	4	16	Ensure appropriate measures are in place such as forced air ventilation, if deemed necessary	Contractor						
Construction																
C1	<u>Access on to dam crest</u>	Interaction of plant and construction workers and general public	No	None - alternative access routes have been investigated - the most appropriate access is from the left bank	S/G	3	3	9	Careful planning prior to mobilisation and good management of construction traffic, including personnel arriving at site and leaving site each day	Contractor						
C2	<u>Underground services</u>	Striking buried services	No	Up to date service plans have been obtained and a visual survey of the site undertaken to check for private services.	S	2	5	10	Contractor to undertake searches prior to commencing works and prior to breaking ground for each activity.	Contractor						
C3	<u>Traffic management on site</u>	Traffic incidents on site - personnel or works struck by plant	No	Limited vehicle movements are envisaged due to the nature of the works.	S	2	5	10	Site traffic management plan to be prepared. Consider segregation of walking routes and construction vehicle routes/working areas.	Contractor						
C4	<u>Working on steep embankment slope</u>	Slips, trips, falls	No	None	S	2	5	10	Careful planning and appropriate means of temporary access, and clearly defined access routes.	Contractor						
C5	<u>Soft Ground and vehicles/plant/cranes/excavators</u>	Construction in and around dam crest and adjacent to watercourse: ground conditions are generally poor - risk of plant or vehicles over-turning	No	None - contractor will require plant to operate on site for implementation of works.	S	2	5	10	Careful planning of works and selection of correct plant for activities/ground conditions	Contractor						
C6	<u>Lifting operations</u>	Crane over-turning.	No	None	S	2	5	10	Contractor to provide method statement & appropriately trained staff/banksman. Prepare lifting plan. Ensure crane platforms have been correctly assessed.	Contractor						
C7	<u>Working near/adjacent to/over water</u>	Risk of drowning	No	None - the works are adjacent to deep and/or fast flowing water.	S/G	3	5	15	Ensure works are appropriately segregated and edge protection in place. Provide appropriate PPE for activities adjacent to or in water.	Contractor						
C8	<u>Flooding</u>	Floods during construction posing risk of pollution, drowning. In worse case leading to catastrophic breach of existing dam with risk to downstream population	No	None - the works are associated with an impounding reservoir	S/G	1	5	5	Construction work not to take place if abnormal rainfall occurs or it is expected that the dam is insufficient to contain the reservoir. This judgement is to be made by a competent person on site. And OCE.	Contractor						
C9	<u>Waterborne/water environment diseases</u>	Weils disease	No	None - the works are adjacent to and within natural watercourses where this hazard may be present.	S	2	5	10	Regular briefings of site staff, ensuring all are aware of the need for good hygiene and aware of the symptoms.	Contractor						
Operation & Maintenance: See separate Hazop Analysis																
Environment																
E1	<u>Use of Raw Materials</u>	Sustainability	No	Sustainable sources of raw materials and maximisation of recycled materials. Sheet piles carefully designed to minimise length	E	2	3	6	Design has controlled risk. There may be further opportunities at construction stage to select more sustainable materials for temporary works.	Contractor						
E2	<u>Noise</u>	Noise impact on habitats and local residents	No	Working hours will be limited. Weekend working will not normally be permitted.	E	2	3	6	Careful planning and selection of construction plant.	Contractor						
E3	<u>Pollution of watercourses from oils/leaks, COSHH Substances, fuel etc</u>	Pollution of watercourse and impact on in-channel and out-of-channel habitats and species	No	Hazardous materials avoided in design where possible, although there is extensive use of concrete poured in-situ.	E	3	5	15	Design has controlled risk. Contractor to ensure measures in place to prevent pollution incidents, including provision of catch trays, spill kits and other suitable measures.	Contractor						
E4	<u>Specific risk of pollution of watercourses with cement</u>	Pollution of watercourse and impact on in-channel and out-of-channel habitats and species	No	Design has considered alternative materials. Concrete is the most suitable material for the proposed works.	E	3	4	12	Contractor must ensure all concreting or grouting works are undertaken with particular care in vicinity of watercourses or water bodies.	Contractor						
E5	<u>Sediment run-off into watercourse</u>	Run-off from exposed clay/dredged silt into watercourse	No	None	E	3	4	12	Careful planning/sequencing of works and provision of silt traps and other appropriate measures. Isolate works from watercourses where possible. Refer to relevant guidance, eg Environment Agency PPG publications.	Contractor						
E5	<u>Invasive plants/species</u>	No invasive species currently identified as being present	No	n/a	E	2	4	8	Further checks to be carried out in advance of works so that control measures can be put in place if necessary	Client						
E6	<u>Ecology: Habitat Regs</u>	General risk to wildlife, fauna, flora, habitats	No	Siphon option poses minimal risk as works are primarily within existing structures	E	1	4	4	Further checks to be carried out in advance of works so that control measures can be put in place if necessary	Client						
E7	<u>Dust</u>	Dust affecting habitats	No	The proposed works minimise the need to disturb existing structures	E	1	3	3	Assess activities at time of construction to determine if further controls are needed.	Contractor						
* S - Site Workers G - General Public E - Environment																
Interpretation of Risk Assessment		Probability 1 = Improbable Occurrence? 2 = Infrequent? 3 = Several times a year? 4 = Monthly? 5 = Weekly?		Severity: Health & Safety 1 = No First Aid Required 2 = First Aid Only Required 3 = 3 Day Injury as defined in RIDDOR 4 = Serious Injury as defined by RIDDOR 5 = Fatality		Severity: Environment 1 = No discernible impact 2 = Minor and temporary impact 3 = Moderate environmental impact, no pollution 4 = Significant environmental incident and impact on habitat 5 = Major environmental incident and loss of habitat		Risk - (Probability x Severity) Minimal Risk = 1 - 5 Tolerable Risk = 6 - 10 Moderate Risk = 11 - 15 Substantial Risk = 16 - 20 Intolerable Risk = 21 - 25								

Project no:

SE108

Project name:

Buckhole Reservoir: Drawdown Options Assessment

Document ref:

SE108_BCH_DRA_001

Date:

01-Jul-18

Risk Analysis Table


Stillwater Associates
 Reservoir Safety & Water Consultancy

Revision: 1

Ref	Topic or Design Element	Associated Hazards	Can hazard be eliminated?	Mitigation of risk at design stage	Residual Risk					Method of controlling risk	Risk Owner/Action By							
					Who is at risk?	Hazard Probability (P) 1 - 5	Severity of hazard (S) 1 - 5	Risk (P x S) 1 - 25										
Risk Analysis for Option 4																		
Demolition																		
D1	<u>Accessing inside of draw-down tower</u>	Scaling tower with ladders, or scaffold access - working at height	No	None	S	3	4	12	Install appropriate means of access/egress	Contractor								
D2	<u>Coring through draw-down tower wall</u>	Working within a confined space	No	It will be necessary to work within the tower, even if coring is undertaken from outside, with reservoir drawn down	S	4	4	16	Ensure appropriate measures are in place such as forced air ventilation, if deemed necessary	Contractor								
Construction																		
C1	<u>Access on to dam crest</u>	Interaction of plant and construction workers and general public	No	None - alternative access routes have been investigated - the most appropriate access is from the left bank	S/G	3	3	9	Careful planning prior to mobilisation and good management of construction traffic, including personnel arriving at site and leaving site each day	Contractor								
C2	<u>Underground services</u>	Striking buried services	No	Up to date service plans have been obtained and a visual survey of the site undertaken to check for private services.	S	2	5	10	Contractor to undertake searches prior to commencing works and prior to breaking ground for each activity.	Contractor								
C3	<u>Traffic management on site</u>	Traffic incidents on site - personnel or works struck by plant	No	Limited vehicle movements are envisaged due to the nature of the works.	S	2	5	10	Site traffic management plan to be prepared. Consider segregation of walking routes and construction vehicle routes/working areas.	Contractor								
C4	<u>Working on steep embankment slope</u>	Slips, trips, falls	No	None	S	2	5	10	Careful planning and appropriate means of temporary access, and clearly defined access routes.	Contractor								
C5	<u>Soft Ground and vehicles/plant/cranes/excavators</u>	Construction in and around dam crest and adjacent to watercourse: ground conditions are generally poor - risk of plant or vehicles overturning	No	None - contractor will require plant to operate on site for implementation of works.	S	2	5	10	Careful planning of works and selection of correct plant for activities/ground conditions	Contractor								
C6	<u>Lifting operations</u>	Crane over-turning.	No	None	S	2	5	10	Contractor to provide method statement & appropriately trained staff/banksman. Prepare lifting plan. Ensure crane platforms have been correctly assessed.	Contractor								
C7	<u>Working near/adjacent to/over water</u>	Risk of drowning	No	None - the works are adjacent to deep and/or fast flowing water.	S/G	3	5	15	Ensure works are appropriately segregated and edge protection in place. Provide appropriate PPE for activities adjacent to or in water.	Contractor								
C8	<u>Flooding</u>	Floods during construction posing risk of pollution, drowning. In worse case leading to catastrophic breach of existing dam with risk to downstream population	No	None - the works are associated with an impounding reservoir	S/G	1	5	5	Construction work not to take place if abnormal rainfall occurs or it is expected that the dam is insufficient to contain the reservoir. This judgement is to be made by a competent person on site. And QCE.	Contractor								
C9	<u>Waterborne/water environment diseases</u>	Weils disease	No	None - the works are adjacent to and within natural watercourses where this hazard may be present.	S	2	5	10	Regular briefings of site staff, ensuring all are aware of the need for good hygiene and aware of the symptoms.	Contractor								
Operation & Maintenance: See separate Hazop Analysis																		
Environment																		
E1	<u>Use of Raw Materials</u>	Sustainability	No	Sustainable sources of raw materials and maximisation of recycled materials. Sheet piles carefully designed to minimise length	E	2	3	6	Design has controlled risk. There may be further opportunities at construction stage to select more sustainable materials for temporary works.	Contractor								
E2	<u>Noise</u>	Noise impact on habitats and local residents	No	Working hours will be limited. Weekend working will not normally be permitted.	E	2	3	6	Careful planning and selection of construction plant.	Contractor								
E3	<u>Pollution of watercourses from oils/leaks, COSHH Substances, fuel etc</u>	Pollution of watercourse and impact on in-channel and out-of-channel habitats and species	No	Hazardous materials avoided in design where possible, although there is extensive use of concrete poured in-situ.	E	3	5	15	Design has controlled risk. Contractor to ensure measures in place to prevent pollution incidents, including provision of catch trays, spill kits and other suitable measures.	Contractor								
E4	<u>Specific risk of pollution of watercourses with cement</u>	Pollution of watercourse and impact on in-channel and out-of-channel habitats and species	No	Design has considered alternative materials. Concrete is the most suitable material for the proposed works.	E	3	4	12	Contractor must ensure all concreting or grouting works are undertaken with particular care in vicinity of watercourses or water bodies.	Contractor								
E5	<u>Sediment run-off into watercourse</u>	Run-off from exposed clay/dredged silt into watercourse	No	None	E	3	4	12	Careful planning/sequencing of works and provision of silt traps and other appropriate measures. Isolate works from watercourses where possible. Refer to relevant guidance, eg Environment Agency PPG publications.	Contractor								
E5	<u>Invasive plants/species</u>	No invasive species currently identified as being present	No	n/a	E	2	4	8	Further checks to be carried out in advance of works so that control measures can be put in place if necessary	Client								
E6	<u>Ecology: Habitat Reqs</u>	General risk to wildlife, fauna, flora, habitats	No	Siphon option poses minimal risk as works are primarily within existing structures	E	1	4	4	Further checks to be carried out in advance of works so that control measures can be put in place if necessary	Client								
E7	<u>Dust</u>	Dust affecting habitats	No	The proposed works minimise the need to disturb existing structures	E	1	3	3	Assess activities at time of constructio to determine if futher controls are needed.	Contractor								
* S - Site Workers G - General Public E - Environment																		
Interpretation of Risk Assessment		Probability 1 = Improbable Occurrence? 2 = Infrequent? 3 = Several times a year? 4 = Monthly? 5 = Weekly?			Severity: Health & Safety 1 = No First Aid Required 2 = First Aid Only Required 3 = 3 Day Injury as defined in RIDDOR 4 = Serious Injury as defined by RIDDOR 5 = Fatality			Severity: Environment 1 = No discernible impact 2 = Minor and temporary impact 3 = Moderate environmental impact, no pollution 4 = Significant environmental incident and impact on habitat 5 = Major environmental incident and loss of habitat			Risk - (Probability x Severity) Minimal Risk = 1 - 5 Tolerable Risk = 6 - 10 Moderate Risk = 11 - 15 Substantial Risk = 16 - 20 Intolerable Risk = 21 - 25							

Project no: SE108
Project name: Buckhole Reservoir: Drawdown Options Assessment
Document ref: SE108_BCH_DRA_001
Date: 01-Jul-18

Hazop Analysis Table

 Stillwater Associates
Reservoir Safety & Water Consultancy

Revision: 1

Ref	Topic or Design Element	Associated Hazards	Can hazard be eliminated?	Mitigation of risk at design stage	Residual Risk					Method of controlling risk	Risk Owner/Action By		
					Who is at risk?	-5 hazard (P)	Probability of 1	Severity of hazard (S)	Risk (P x S)				
Operation & Maintenance: Option 1 [Operation & Maintenance of Low-Level Siphon through Overflow Structure]													
OM1	<u>Operating control valves</u>	Access to operate valves and operating area	Yes	Ensure all accesses are safe, and secure with appropriate edge restraint and satisfactory operating area	S/G	2	2	4	Design has controlled risk		Client (represented by designer)		
OM2	<u>Siphon priming with vacuum pump</u>	Injury to operatives	Yes	Operations can be from crest level: accesses can be made safe. Equipment will be accessible at crest level, with locked covers.	S/G	2	2	4	Design has controlled risk		Client (represented by designer)		
OM3	<u>Maintenance of valves and pipework</u>	Possible entry into and working within confined space, with flowing water	Yes	The siphon spillway chamber can be adequately ventilated, and safe access arranged, to eliminate the confined space hazard. Maintenance would be during periods of low flow or with reservoir level lowered.	S	2	4	8	Design has controlled risk		Client		
Operation & Maintenance: Option 2 [Operation & Maintenance of Low-Level Siphon through Embankment]													
OM4	<u>Operating control valves</u>	Access to operate valves and operating area	Yes	Ensure all accesses are safe, and secure with appropriate edge restraint and satisfactory operating area	S/G	2	2	4	Design has controlled risk		Client (represented by designer)		
OM5	<u>Siphon priming with vacuum pump</u>	Injury to operatives	Yes	Operations can be from crest level: accesses can be made safe. Equipment will be accessible at crest level, with locked covers.	S/G	2	2	4	Design has controlled risk		Client (represented by designer)		
OM6	<u>Maintenance of valves and pipework</u>	Access to upstream valves adjacent to deep water	Yes	All valves can be access from ground level with no confined space entries required, and suitable edge restraint can be included in design to protect against deep water hazard	S	2	4	8	Design has controlled risk		Client (represented by designer)		
Operation & Maintenance: Option 3 [Operation & Maintenance of Left-bank Bywash Valves and Valves in Draw-off Tower]													
OM7	<u>Operating control valves - Bywash Chamber</u>	Access to operate valves and operating area	Yes	Valves are at crest level, with satisfactory safe access and working area. Valves spindles accessed beneath locked covers.	S/G	2	2	4	Design has controlled risk		Client (represented by designer)		
OM8	<u>Operating control valves - draw-off tower</u>	Access via boat over deep water, scaling ladder over deep water and operating valves on draw-off tower platform, over deep water	No	Hazard is inherent with location of valves. Risk is made greater if access is during the night or with poor weather.	S	3	4	12	Design is not proposing to address this pre-existing hazard. A significantly more involved intervention would be needed to address the hazard		Client		
OM9	<u>Maintaining valves and pipework within by-wash chamber</u>	Access is poor, into a confined space, with very limited working space.	No	Hazard is inherent with location of valves and existing structure. A confined spaces team would be required for entry.	S	4	4	16	Significant interventions would be needed, beyond the scope of the proposed design to reduce the severity of this hazard.		Client		
OM10	<u>Maintaining valves and pipework within draw-off tower</u>	Access is poor, across water, scaling a ladder, and then entering the draw-off tower confined space	No	Hazard is inherent with location of valves and existing structure. A confined spaces team would be required for entry, which would be difficult to implement due to the significant constraints on the tower. This would also put more personnel at risk.	S	4	4	16	Significant interventions would be needed, beyond the scope of the proposed design to reduce the severity of this hazard.		Client		
Operation & Maintenance: Option 4 [Operation & Maintenance of Valves in Draw-off Tower]													
OM11	<u>Operating control valves - draw-off tower</u>	Access via boat over deep water, scaling ladder over deep water and operating valves on draw-off tower platform, over deep water	No	Hazard is inherent with location of valves. Risk is made greater if access is during the night or with poor weather.	S	3	4	12	Design is not proposing to address this pre-existing hazard. A significantly more involved intervention would be needed to address the hazard		Client		
OM12	<u>Maintaining valves and pipework within draw-off tower</u>	Access is poor, across water, scaling a ladder, and then entering the draw-off tower confined space	No	Hazard is inherent with location of valves and existing structure. A confined spaces team would be required for entry, which would be difficult to implement due to the significant constraints on the tower. This would also put more personnel at risk.	S	4	4	16	Significant interventions would be needed, beyond the scope of the proposed design to reduce the severity of this hazard.		Client		
* S - Site Workers G - General Public E - Environment													
Interpretation of Risk Assessment		Probability 1 = Improbable Occurrence? 2 = Infrequent? 3 = Several times a year? 4 = Monthly? 5 = Weekly?			Severity: Health & Safety 1 = No First Aid Required 2 = First Aid Only Required 3 = 3 Day Injury as defined in RIDDOR 4 = Serious Injury as defined by RIDDOR 5 = Fatality			Severity: Environment 1 = No discernible impact 2 = Minor and temporary impact 3 = Moderate environmental impact, no pollution 4 = Significant environmental incident and impact on habitat 5 = Major environmental incident and loss of habitat			Risk - (Probability x Severity) Minimal Risk = 1 - 5 Tolerable Risk = 6 - 10 Moderate Risk = 11 - 15 Substantial Risk = 16 - 20 Intolerable Risk = 21 - 25		

Option 1: Siphon through overflow structure

6 Weeks Duration

<i>Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Rate</i>	<i>Amount</i>
A1	Prelims	Week	6	£3,300.00	£19,800.00
A2	355mm Dia MDPE Pipes - 24m	Sum	1	£4,238.00	£4,238.00
A3	Core Drill	Sum	1	£1,628.00	£1,628.00
A4	New Steps and Platform	Sum	1	£3,469.00	£3,469.00
A5	Concrete Pedestals x 3	Sum	1	£723.00	£723.00
A6	Access Cover	Sum	1	£1,713.00	£1,713.00
A7	Over-pumping	Sum	1	£4,309.00	£4,309.00
A8	Labour & plant	Sum	1	£16,837.00	£16,837.00
A9	Handrail	Sum	1	£634.00	£634.00
A10	300mm DI Pipes - 56m	Sum	1	£17,600.00	£17,600.00
A11	PCC Pipe Collars	Sum	1	£7,350.00	£7,350.00
A99	Allowance for divers	Sum	1	£9,000.00	£9,000.00
Sub-Total A					£87,300.00
B1	Contingencies	%	30	£87,300.00	£26,190.00
Sub-Total B					£26,190.00
C1	Design & Management Fees	%	15	£113,490.00	£17,023.50
C2	Principal Designer	Hours	56	£65.00	£3,640.00
C3	Site Supervision	Hours	168	£65.00	£10,920.00
C4	QCE	Hours	40	£85.00	£3,400.00
C5	Expenses	Sum	1	£600.00	£600.00
Sub-Total C					£35,583.50
Grand Total					£149,073.50
Grand Total (Rounded)					£150,000.00

This page is intentionally left blank

Public Document Pack

Cabinet Agenda

Monday, 3 February 2020 at 6.00 pm

Council Chamber, Muriel Matters House, Breeds Place, Hastings, East Sussex, TN34 3UY

If you are attending Muriel Matters House for this meeting, please enter the building via the Tourist Information Centre entrance. Members of public are advised that they will need to sign in to comply with health and safety legislation and will be escorted up to the Committee Room.

For further information, please contact Democratic Services on 01424 451484 or email: democraticservices@hastings.gov.uk

	Page No.
1. Apologies for Absence	
2. Declaration of Interests	
3. Minutes of Last Meeting	1 - 6
4. Local Nature Reserves - Byelaws <i>(Mike Hepworth, Assistant Director Environment and Place) (Council decision)</i>	7 - 62
5. Pay Policy Statement 2020/21 <i>(Jane Hartnell, Director of Corporate Services and Governance) (Council decision)</i>	63 - 72
6. Review of HMO Licensing Fees <i>(Andrew Palmer, Assistant Director Housing and Built Environment) (Council decision)</i>	73 - 80
7. Notification of Additional Urgent Items	
8. Urgent Items (if any)	

This page is intentionally left blank

Agenda Item 3 Public Document Pack

CABINET

6 JANUARY 2020

Present: Councillors Chowney (Chair), Forward (Vice Chair), Batsford, S Beaney, Evans, Fitzgerald, Rogers, Lee and Patmore

224. APOLOGIES FOR ABSENCE

None

225. DECLARATION OF INTERESTS

None

226. MINUTES OF LAST MEETING

RESOLVED – that the minutes of the cabinet meeting held on 18th December 2019 be approved as a true record.

RESOLVED the chair called over the items on the agenda, all items were discussed at the meeting.

227. BOHEMIA LEISURE AND CULTURAL FACILITIES STUDY

The Director of Operational Services presented a report that updated Cabinet on the Bohemia leisure and cultural facilities options appraisal study. The report makes recommendations for the next steps in the scheme.

The study had been undertaken led by consultants Continuum. They have done a considerable amount of work and have held regular meetings with the relevant officers and lead councillors. They have consulted with a number of stakeholders including leisure and cultural sectors locally, and sport's national governing bodies, operators and local authority neighbours.

The next step is to commission detailed site and topographical surveys of the land. This would be before detailed site and building design works would commence. This would help to de-risk the project before more substantial sums are invested in detailed design work, and will make any development a more attractive proposition for investors/partners.

Councillors discussed the benefits that this would bring to the town's residents. Residents were looking forward to this development and there was a real need for access to high quality activities to improve wellbeing and health within the town. The current leisure facilities are no longer fit for purpose based on the town's needs. Repairing the facilities would actually cost more in the long term.

Councillors were pleased with the proposals but some felt that it was the wrong time to be spending the money given the Council's current financial position.

CABINET

6 JANUARY 2020

Councillors spoke about a council that had completed a similar project which produced significant measurable positive effects for these residents including savings for other public bodies such as health services. They believe that this could negate the effects of deprivation within the town.

The proposed works aim to offset the costs. Councillors felt that spending the money for survey work was a good investment in a project that would benefit residents.

Councillor Forward proposed approval of the recommendations of the report, seconded by Councillor Batsford.

RESOLVED (7 for, 2 against)

- 1. To agree in principle to provide a new leisure centre and leisure water, and primary entertainment centre on the Bohemia site, significantly improving on the town's current leisure and cultural offer, with provision for adding an arts centre if capital and revenue funding can be obtained**
- 2. £100 000 be set aside to commission detailed site and topographical surveys of the land, to inform and de-risk the next stage of the work; £35 000 to come from existing budgets, £65 000 to be a 'growth item' funded from general reserves**
- 3. A report be brought back to cabinet in autumn 2020 reporting on the outcome of the site surveys, recommending a location for the new leisure and entertainment centre, with provision for an arts centre, which would also take into account the potential value of investing in housing elsewhere on the site. This would consider alternative models for financing the work, and include a funding/partnership/investment strategy.**

Reasons for Recommendation

To ensure that the project can be taken forward in a sensible, cost-effective way.

228. TREASURY MANAGEMENT - MID-YEAR REPORT 2019-20

The Assistant Director Financial Services & Revenues (Chief Finance Officer) presented a report that advises Cabinet of the Treasury Management activities and performance during the current year. It provides the opportunity to review the Treasury Management Strategy and make appropriate recommendations to Council to take account of any issues or concerns that have arisen since approving it in February 2019.

The Assistant Director Financial Services & Revenues discussed how the Council has had good returns on the investments it has made. These have been spread to minimise risk which is standard practice. The Council has borrowed significant amount from the Public Loans Works Board (PWLB) usually for investments in commercial property. The Council are still able to borrow more but the there is a limited maximum amount. Councillors will need to consider this when looking at future borrowing.

CABINET

6 JANUARY 2020

Councillors discussed how positive investments had been. They recognised that the Council was borrowing more but wanted the recognition that this is a result of needing to replace lost government funding. The investments had worked for the Council and the income from this has helped to reduce the Council's deficit.

Commercial property that was brought several decades ago was now helping the council's finances and it is hoped that the more recent purchases and investments would have the same effect for the future.

The Assistant Director Financial Services & Revenues added a further recommendation to the report as;

'Cabinet recommends that the report goes to Council and they agree the Mid-Year report.'

Councillor Chowney proposed approval of the recommendations of the report and the meeting. This was seconded by Councillor Lee.

RESOLVED (Unanimously)

- 1. Cabinet recommends that the report goes to Council and they agree the Mid-Year report.**

Reasons for Recommendations

The Code of Practice on Treasury Management requires, as a minimum, a mid-year review of the Treasury Management Strategy and performance. This is intended to highlight any areas of concern that have arisen since the original strategy was approved (February 2019). It is a requirement of the Code of Practice that the Mid-year review is considered by Cabinet and full Council.

229. TOWN DEAL

The Assistant Director, Regeneration and Culture presented a report that sets out the purpose of the Town Fund, and both the partnership and work arrangements which need to be put in place to access the Town Fund.

The report seeks both the support for the direction of travel and authority to spend up to £173,029 'capacity' funding in delivering a successful town bid. A Town Board would be set up and its membership would include partners from local businesses and the community. A Town Investment Plan would be developed and a project team would oversee the development and implementation of these plans.

Councillors were supportive of securing this funding. They saw this as an opportunity to help draw down from other funds and that it has the potential to fit in with other schemes.

Councillors were disappointed with the short length of time they have to find members for the Town Board. They would ideally like to reach out to parts of the community that don't traditionally engage with the Council such as those from deprived wards. This looks unlikely to happen but Councillors were kind to support more focussed work

CABINET

6 JANUARY 2020

within the community. They hoped that any consultation work would focus on gathering views and engaging people from these communities.

Councillor Chowney proposed approval of the recommendations of the report, seconded by Councillor Rogers.

RESOLVED (Unanimously)

1. To delegate authority to the Director of Operational Services or his nominee in consultation with the Lead Member for Regeneration and Culture to:

- Establish a Town Board and agree its membership with the relevant partners including with local businesses and the community.**
- To procure services and expertise to develop a Town Investment Plan and agree the Town Deal using the £173,029 awarded by the government to support this initiative.**
- To establish a project team to oversee the development of the plans and its implementation in conjunction with the County Council and other partners as appropriate.**

Reasons for Recommendations

1. The government recently launched the Towns Fund with the objective of driving the economic regeneration of towns such as Hastings and delivering long term economic and productivity growth. The Towns Fund will provide up to £25 million public investment by central government through the agreement of a Town Deal.
2. There is also the possibility of additional funding which may come from other sources or branches of government and private investment, to support the implementation of a Town Deal. It offers an opportunity for Hastings to address many of the remaining social and economic challenges in the town as a whole.

230. BUCKSHOLE RESERVOIR

The Assistant Director Environment and Place presented a report for cabinet to consider and agree the following:-

- The most appropriate scheme of works to improve the operation of the reservoir in accordance with the relevant statutory requirements.
- The way the project will be managed and delivered, including the appointment of specialist contractors to support the project throughout the design and construction phases.
- The budget for the project.

The Assistant Director Environment and Place discussed the needs for these works and are classed as high risk. There is a statutory requirement to modify the spillway and reduce the water level and the works need to be completed by April 2022.

CABINET

6 JANUARY 2020

Councillors were concerned by the large amounts of money needed for this work. The funding settlement from Government does not include a budget for these works. It was recommended and agreed cross party that the LGA would be contacted to seek similar Local Authorities to write to the Environmental agency for additional funding.

Councillor Fitzgerald proposed approval of the recommendations of the report and the meeting. This was seconded by Councillor Evans.

RESOLVED (Unanimously)

- 1. Cabinet agrees that the 2 options recommended by Stillwater Associates Ltd in the reports attached at appendices 1 and 2 are the most appropriate way for the council to meet the requirements of the Reservoirs Act 1975.**
- 2. Cabinet authorises the Director of Operational Services to work with the East Sussex Procurement Hub, to procure and let a contract to deliver the two options recommended in the reports attached at appendices 1 and 2.**
- 3. Cabinet authorises the Director of Operational Services to contract with Stillwater Associates Ltd to provide the main specialist technical support to the council throughout the project, including that referred to in paragraph 18. As well as contracting with any other specialist contractors that may be required.**
- 4. Cabinet increases the capital programme budget for Buckhole Reservoir from £71,000 to £837,000 and agrees the revenue implications of an additional £62,775 p.a. as detailed in paragraphs 33 to 36.**
- 5. It was agreed cross party that the LGA would be contacted to seek similar Local Authorities to write to the Environmental agency for additional funding.**

Reasons for Recommendations

The works to the reservoir are a mandatory requirement enforced by the Environment Agency, and the council needs to approve a scheme of works to secure compliance with the current statutory guidance.

A specialist approved reservoirs contractor has provided the council with comprehensive reports evaluating the options and recommending those, which they believe, are the most appropriate.

Following discussions between the council's specialist reservoirs inspection contractor and the Environment Agency, the deadline for completing the works is provisionally April 2022.

CABINET

6 JANUARY 2020

(The Chair declared the meeting closed at 7.26 pm)

Agenda Item 4



Report to: Cabinet

Date of Meeting: 3rd February 2020

Report Title: Local Nature Reserves - Byelaws

Report By: Mike Hepworth, Assistant Director, Environment and Place

Purpose of Report

To outline the procedure for approval of byelaws for Local Nature Reserves in the Borough of Hastings.

Recommendation(s)

1. To recommend to Full Council that the following byelaws are made , Filsham Reedbeds Nature Reserve, Marline Valley Nature Reserve, Hastings Country Park Nature Reserve, St Helens Wood Nature Reserve, Church Wood and Robsack Local Nature Reserve, Summerfields Nature Reserve and Old Road Gill Nature Reserve
2. Following Cabinet and Full Council approval to make the byelaws, delegate to the Chief Legal Officer responsibility for following due legal process as outlined by the Department for Environment, Food and Rural Affairs for confirmation of the byelaws for Local Nature Reserves.

Reasons for Recommendations

Local Authorities can create Local Nature Reserve byelaws to help stop people damaging the reserve and harming its wildlife. Adopting byelaws will help the council safeguard the reserves from damage.

Introduction

1. Byelaws are a way of safeguarding nature reserves from damage. The proposed byelaws aim to bring all our nature reserves under one set of consistent byelaws together with their current boundaries.
2. There are eight Local Nature Reserves (LNRs) in the borough; Hastings Country Park Nature Reserve, Pondswood Nature Reserve, Churchwood and Robsack Wood Nature Reserve, Summerfields Wood, Marline Valley Nature Reserve, Filsham Reedbeds Nature Reserve, Old Roar Gill and Coronation Wood Nature Reserve and St. Helens Woods Nature Reserve.
3. Seven of the reserves are owned by Hastings Borough Council. St Helens Woods are owned by the St Helens Park Preservation Society.
4. Pondswood was designated a Local Nature Reserve after the public consultation relating to these byelaws proposals were completed and cannot be included in this byelaw process. We will bring Pondswood LNR byelaws proposals forward for approval at a later date after this has been consulted upon.
5. Four Local Nature Reserves currently have byelaws; Filsham Reedbeds which were made by Hastings Borough Council on 25th July 1983; Hastings Country Park, made on 28th June 1974; Marline Woods, made on 12th February 1993 and St Helens Wood on 31st March 1994. These will be revoked and replaced by the new draft set of byelaws.

Creating byelaws for Local Nature Reserves

6. The Department for Environment, Food and Rural Affairs (DEFRA) set out a procedure for the creation of byelaws for Local Nature Reserves. They published a set of model byelaws for authorities to consider when creating their own byelaws. Any deviation from the model byelaws has to be approved by DEFRA.
7. The draft byelaws for our Local Nature Reserves were subject to public consultation from December 2014 until the end of February 2015. We received 8 responses which were points of clarification. There were no objections.
8. Following consultation the council was required to send the draft byelaws to Natural England for comment and then to the Secretary of State for Environment Food and Rural Affairs.
9. It has taken until this year to obtain provisional approval from DEFRA. The delay has been due to significant numbers of staff changes in both Natural England and DEFRA, with each change in staff compounding the delay with further comments and queries.
10. The council, through the Chief Legal Officer, lodged an official complaint in 2019 to DEFRA over the unacceptable delay.

Equalities and Community Cohesiveness

11. The byelaws were subject to full public consultation. All feedback received was considered in drafting the final set of byelaws.

Crime and Fear of Crime

12. The implementation of byelaws is intended to reduce anti-social behaviour and protect wildlife.

Environmental Issues

13. Byelaws for nature reserves are intended to reduce activities that could harm habitats and wildlife in our protected nature areas of the borough.

Local People's Views

14. The byelaws were subject to full public consultation. All feedback received was considered in drafting the final set of byelaws. No objections were received. The proposed Byelaws will be subject to a further period of consultation where representations can be made to the Secretary of State for Environment Food and Rural Affairs prior to adoption.

Procedure for adoption

15. The draft byelaws are presented to Cabinet for their endorsement. Following Cabinet's endorsement they will be presented to Full Council for approval to be made.
16. Subject to approval by Full Council the council will;
- Make the byelaws on 13th February 2020 and seal and sign;
 - Advertise in the local press the fact that the bye laws have been made, giving members of the public one month within which they can comment to the Secretary of State;
 - Consider and respond to any comments from the public passed on from DEFRA;
 - Apply to the Secretary of State for Environment and Rural Affairs for confirmation of the byelaws by sending 2 sealed and signed copies of each byelaw.

Timetable of Next Steps

17. Please include a list of key actions and the scheduled dates for these:

Action	Key milestone	Due date (provisional)	Responsible
--------	---------------	------------------------	-------------

Byelaws made	Approvals by Full Council	12 th February 2020	Full Council
Publish Public Notice in local press	One month period on deposit at TIC	14 th February – 14 th March 2020	Chief Legal Officer
Send byelaws to DEFRA	Confirmation and effective date by DEFRA	April 2020	Chief Legal Officer and DEFRA

Wards Affected

All

Implications

Relevant project tools applied? Not applicable

Have you checked this report for plain English and readability? Yes

Climate change implications considered? No implications

Please identify if this report contains any implications for the following:

Equalities and Community Cohesiveness	yes
Crime and Fear of Crime (Section 17)	yes
Risk Management	no
Environmental Issues	yes
Economic/Financial Implications	no
Human Rights Act	no
Organisational Consequences	no
Local People's Views	yes
Anti-Poverty	no

Additional Information

Proposed byelaws for each of the Local Nature Reserves

Officer to Contact

Officer Name Murray Davidson
 Officer Email Address mdavidson@hastings.gov.uk
 Officer Telephone Number 01424 451107

This page is intentionally left blank

Byelaws

Churchwood and Robsack Wood Nature Reserve

Hastings Borough Council – Nature Reserves

Hastings Borough Council in exercise of the powers conferred upon them by Sections 201, 21(4)₂ and 106₃ of the National Parks and Access to the Countryside Act 1949 in accordance with Section 236 of the Local Government Act 1972 hereby make the following byelaws for the protection of the Nature Reserve at Churchwood and Robsack Wood in the County of East Sussex:

1. In these byelaws

- a. "The Reserve" shall mean the pieces or parcels of land containing in the whole 29.32 hectares or thereabouts and in the County of East Sussex. Declared to be managed as a Nature Reserve by declarations dated the 23 day of April 2004 made by the Hastings Borough Council. In pursuance of Section 19 and 21 of the National Parks and Access to the Countryside Act 1949, and the Reserve is for the purposes of identification shown as nearly as may be on the map annexed to these byelaws and therein edged black.
 - b. "The Council" shall mean Hastings Borough Council.
 - c. "Firearm" shall have the same meaning as in Section 57 of the Firearms Act 1968.
2. Within the Reserve the following acts are hereby prohibited except insofar as they may be authorised by a permit issued by the Council in accordance with Byelaw 4 , or are necessary to the proper execution of his duty by an officer of the Council or by any person, or servant of any person, employed or authorised by the Council.

Damage to or disturbance of things in the Reserve

- (i) spreading or using any net, or setting or using any lamp or other instrument, or any snare or lure, for the taking, injury or destruction of any living creature.
- (ii) taking molesting or intentionally disturbing, injuring or killing any living creature.
- (iii) taking or intentionally disturbing or destroying the eggs, larvae, pupae or other immature stages, or the place used for shelter or protection of any living creature.
- (iv) intentionally removing or displacing any tree, shrub, plant, fungus or part thereof, or any unfashioned mineral thing including water.

Foot notes:

1. Amended by Natural Environment and Rural Communities (NERC) Act 2006.
Telecommunications Act 1984, Water Act 1989 and Communications Act 2003.
2. Amended by the (NERC) Act 2006
3. Amended by the (NERC) Act 2006 and the Environmental Protection Act 1990)

Bringing Animals into the Reserve

- (v) intentionally bringing, or permitting to be brought, into the Reserve any living creature, or the egg of any living creature, or any plant, or any seed or other part of any plant, in such circumstances that it is likely that such creature or plant will reproduce or propagate itself, or such egg will hatch, or such seed will germinate.
- (vi) bringing into, or permitting to remain within the Reserve any animal other than a dog ensuring it is kept under proper control and is prevented from worrying or disturbing any animal or bird.
- (vii) turning out any animal or poultry to feed or graze.
- (viii) exercising/flying any bird of prey.
- (ix) no person shall lead or ride any horse or pony unless it is in an area set aside and clearly signed for that purpose.

Footnote:

The Public Spaces Protection Order (No1) made under S.59 of The Anti-social Behaviour, Crime & Policing Act 2014 is in effect at Churchwood & Robsack Nature Reserve. This order details offences in relation to dogs.

Areas of water

- (x) committing any act which pollutes or is likely to cause pollution of any water.
- (xi) obstructing any flow or any drain or watercourse.

Use of Vehicles

- (xii) driving, riding, propelling or leaving any mechanically propelled vehicle elsewhere than on a highway or on a road, or in a place indicated by a notice as being available for the purpose and not exceeding 10mph.
- (xiii) any person with an agreed permit to travel within the greater reserve shall not exceed 10mph and will drive with hazard lights on and give way to pedestrians at all times.

Use of certain Equipment

- (xiv) using any apparatus for the transmission, reception, reproduction or amplification of any sound, speech or images by electrical or mechanical means, except photographic equipment, apparatus designed and used as an aid to defective hearing and apparatus used in a vehicle so as not to produce sound audible by a person outside the vehicle.
- (xv) using any device designed or adapted for detecting or locating any metal or mineral in the Reserve.

Use of firearms etc.

- (xvi) being in possession of a firearm (with ammunition suitable for use in that firearm) or discharging a firearm or lighting a firework.
- (xvii) projecting any missile manually or by artificial means.

General Prohibitions

- (xviii) erecting, occupying or using any tent, caravan or other structure for the purpose of camping elsewhere than in an area indicated by a notice as being available for camping.
- (xix) flying any model aircraft.
- (xx) erecting any post, rail, fence, pole, booth, stand, building or other structure.
 - a. neglecting to shut any gate or to fasten it if any means of doing so are provided.
- (xxi) posting or placing any notice or advertisement.
- (xxii) selling or offering or exposing for sale, or letting for hire or offering or exposing for letting for hire, any commodity or article, or selling or offering for sale any service.
 - a. engaging in any activity which is causing or likely to cause a disturbance.
 - b. holding any show, performance, public meeting, exhibition or sports or the playing of any organised games.
- (xxiii) cycling, roller skating or skate boarding.
- (xxiv) lighting any fire, stove, heater or other appliance capable of causing a fire, elsewhere than in an area indicated by a notice as being available for BBQs.

- (xxv) letting fall, or throwing any lighted match or lighted substance in a manner likely to cause a fire.
- (xxvi) intentionally leaving items in a place other than a receptacle provided by the Council for deposit of litter or refuse.

3. Interference with Duly Authorised Officer

Intentionally obstructing any officer of the Council or any person, or the servant of a person, employed or authorised by the Council in the execution of any works including research or scientific work connected with the laying out, maintenance or management of the Reserve.

4. Permits

- (i) the Council may issue permits authorising any person to do any act or class of acts within the Reserve or any part thereof which would otherwise be unlawful under these byelaws.
- (ii) any such permit shall be issued subject to the following conditions:
 - (a) that it must be carried whenever a visit is made to the Reserve, and produced for inspection when required by a person duly authorised by the Council in that behalf; and
 - (b) that it may be revoked by the Council at any time.

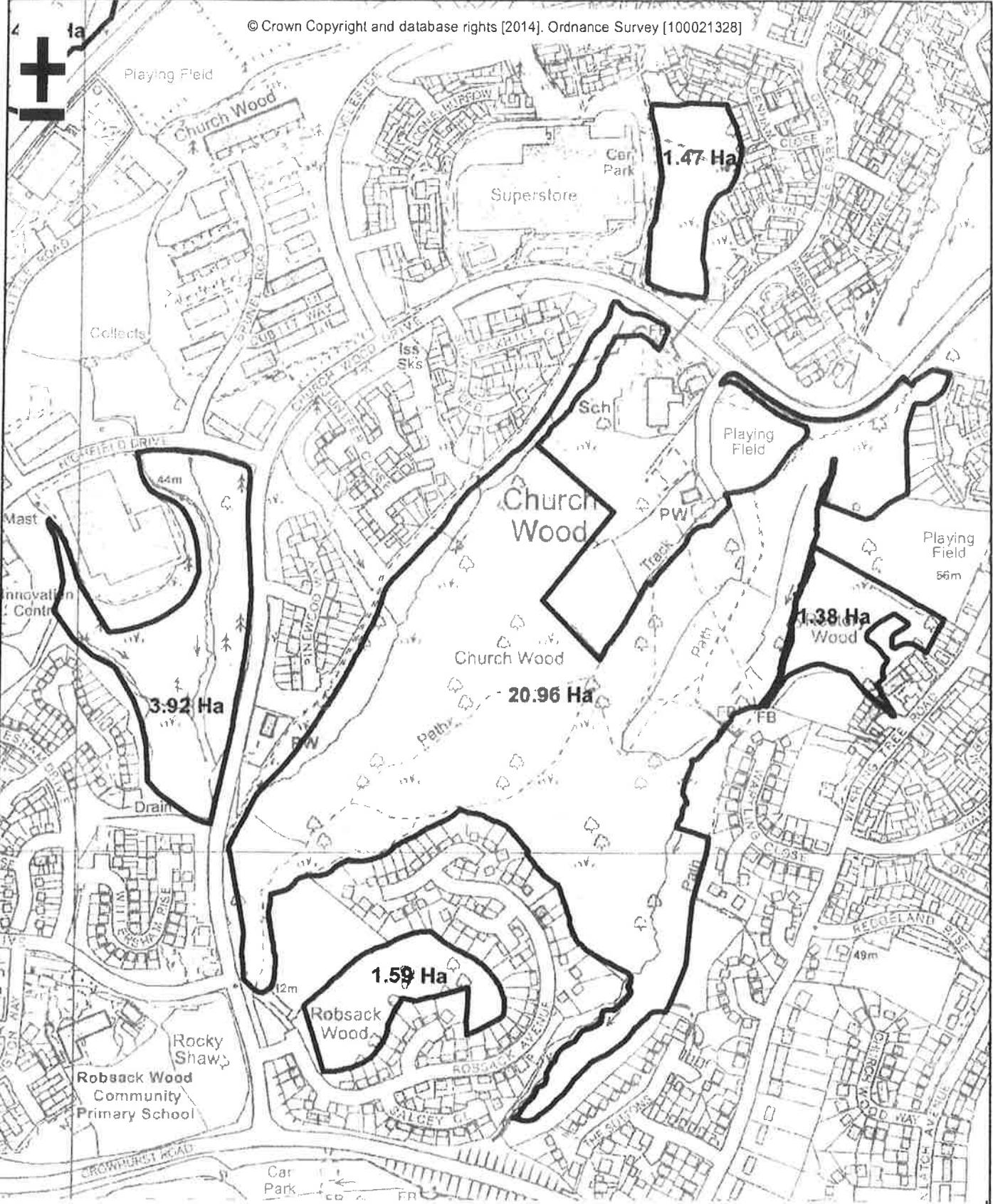
5. Byelaws

These byelaws shall not operate so as to interfere with the exercise:

- (i) by a person of
 - (a) a right vested in him/her as owner, lessee or occupier of land in the reserve,
 - (b) any easement or profit à prendre to which he is entitled,
 - (b) any public right of way.
- (ii) of any functions of a local authority, statutory undertaker or drainage authority
- (iii) by a constable or a member of the armed forces or of any fire brigade or ambulance service of the performance of his duty.

6. Penalty

Any person who offends against any of these byelaws shall be liable on summary conviction to a fine not exceeding Level 2 on the Standard Scale and in the case of a continuing offence to a further fine for each day during which the offence continues after the said conviction.



Churchwood & Robsack Wood Local Nature Reserve

41
MAP NR1

Date: Jul 2014	Terms and Conditions of Use of Ordnance Survey Material i) You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which Hastings Borough Council makes it available; ii) You are not permitted to copy, sub-license, distribute, sell or otherwise make available any Data to third parties in any form; and iii) Third party rights to enforce the terms of this licence shall be reserved to Ordnance Survey.	Borough COUNCIL
Scale: 1:5,500		

Byelaws

Filsham Reed Beds Nature Reserve

Hastings Borough Council – Nature Reserves

Hastings Borough Council in exercise of the powers conferred upon them by Sections 201, 21(4)₂ and 106₃ of the National Parks and Access to the Countryside Act 1949 in accordance with Section 236 of the Local Government Act 1972 hereby make the following byelaws for the protection of the Nature Reserve at Filsham Reed Beds in the County of East Sussex:

1. In these byelaws

- a. "The Reserve" shall mean the pieces or parcels of land containing in the whole 18.8 hectares or thereabouts and in the County of East Sussex. Declared to be managed as a Nature Reserve by the declaration dated the 20 day of July 1983 made by the Hastings Borough Council. In pursuance of Section 19 and 21 of the National Parks and Access to the Countryside Act 1949, and the Reserve is for the purposes of identification shown as nearly as may be on the map annexed to these byelaws and therein edged black.
 - b. "The Council" shall mean Hastings Borough Council.
 - c. "Firearm" shall have the same meaning as in Section 57 of the Firearms Act 1968.
2. Within the Reserve the following acts are hereby prohibited except insofar as they may be authorised by a permit issued by the Council in accordance with Byelaw 4, or are necessary to the proper execution of his duty by an officer of the Council or by any person, or servant of any person, employed or authorised by the Council.

Damage to or disturbance of things in the Reserve

- (i) spreading or using any net, or setting or using any lamp or other instrument, or any snare or lure, for the taking, injury or destruction of any living creature.
- (ii) taking molesting or intentionally disturbing, injuring or killing any living creature.
- (iii) taking or intentionally disturbing or destroying the eggs, larvae, pupae or other immature stages, or the place used for shelter or protection of any living creature.
- (iv) intentionally removing or displacing any tree, shrub, plant, fungus or part thereof, or any unfashioned mineral thing including water.

Foot notes:

1. Amended by Natural Environment and Rural Communities (NERC) Act 2006.
Telecommunications Act 1984, Water Act 1989 and Communications Act 2003.
2. Amended by the (NERC) Act 2006
3. Amended by the (NERC) Act 2006 and the Environmental Protection Act 1990)

Bringing Animals into the Reserve

- (v) intentionally bringing, or permitting to be brought, into the Reserve any living creature, or the egg of any living creature, or any plant, or any seed or other part of any plant, in such circumstances that it is likely that such creature or plant will reproduce or propagate itself, or such egg will hatch, or such seed will germinate.
- (vi) bringing into, or permitting to remain within the Reserve any animal other than a dog ensuring it is kept under proper control and is prevented from worrying or disturbing any animal or bird.
- (vii) turning out any animal or poultry to feed or graze.
- (viii) exercising/flying any bird of prey.
- (ix) no person shall lead or ride any horse or pony unless it is in an area set aside and clearly signed for that purpose.

Footnote:

The Public Spaces Protection Order (No1) made under S.59 of The Anti-social Behaviour, Crime & Policing Act 2014 is in effect at Filsham Reed Beds Nature Reserve. This order details offences in relation to dogs.

Areas of water

- (x) committing any act which pollutes or is likely to cause pollution of any water.
- (xi) bathing or wading in any water in contravention of a notice exhibited beside that water by order of the Council.
- (xii) sailing model boats.
- (xiii) propelling (by any means whatever) any boat on an area or stretch of water other than a public waterway in contravention of a notice exhibited beside that water by the Council.
- (xiv) obstructing any flow or any drain or watercourse.

Use of Vehicles

- (xv) driving, riding, propelling or leaving any mechanically propelled vehicle elsewhere than on a highway or on a road, or in a place indicated by a notice as being available for the purpose and not exceeding 10mph.
- (xvi) any person with an agreed permit to travel within the greater reserve shall not exceed 10mph and will drive with hazard lights on and give way to pedestrians at all times.

Use of certain Equipment

- (xvii) using any apparatus for the transmission, reception, reproduction or amplification of any sound, speech or images by electrical or mechanical means, except photographic equipment, apparatus designed and used as an aid to defective hearing and apparatus used in a vehicle so as not to produce sound audible by a person outside the vehicle.
- (xviii) using any device designed or adapted for detecting or locating any metal or mineral in the Reserve.

Use of firearms etc.

- (xix) being in possession of a firearm (with ammunition suitable for use in that firearm) or discharging a firearm or lighting a firework.
- (xx) projecting any missile manually or by artificial means.

General Prohibitions

- (xxi) erecting, occupying or using any tent, caravan or other structure for the purpose of camping elsewhere than in an area indicated by a notice as being available for camping.
- (xxii) flying any model aircraft.
- (xxiii) erecting any post, rail, fence, pole, booth, stand, building or other structure.
- (xxiv) neglecting to shut any gate or to fasten it if any means of doing so are provided.
- (xxv) posting or placing any notice or advertisement.
- (xxvi) engaging in any activity which is causing or likely to cause a disturbance
- (xxvii) cycling, roller skating or skate boarding.

- (xxviii) lighting any fire, stove, heater or other appliance capable of causing a fire, elsewhere than in an area indicated by a notice as being available for BBQs.
- (xxix) letting fall, or throwing any lighted match or lighted substance in a manner likely to cause a fire.
- (xxx) intentionally leaving items in a place other than a receptacle provided by the Council for deposit of litter or refuse.

3. Interference with Duly Authorised Officer

Intentionally obstructing any officer of the Council or any person, or the servant of a person, employed or authorised by the Council in the execution of any works including research or scientific work connected with the laying out, maintenance or management of the Reserve.

4. Permits

- (i) the Council may issue permits authorising any person to do any act or class of acts within the Reserve or any part thereof which would otherwise be unlawful under these byelaws.
- (ii) any such permit shall be issued subject to the following conditions:
 - (a) that it must be carried whenever a visit is made to the Reserve, and produced for inspection when required by a person duly authorised by the Council in that behalf; and
 - (b) that it may be revoked by the Council at any time.

5. Byelaws

These byelaws shall not operate so as to interfere with the exercise:

- (i) by a person of
 - (a) a right vested in him/her as owner, lessee or occupier of land in the reserve,
 - (b) any easement or profit à prendre to which he is entitled,
 - (c) any public right of way.
- (ii) of any functions of a local authority, statutory undertaker or drainage authority.

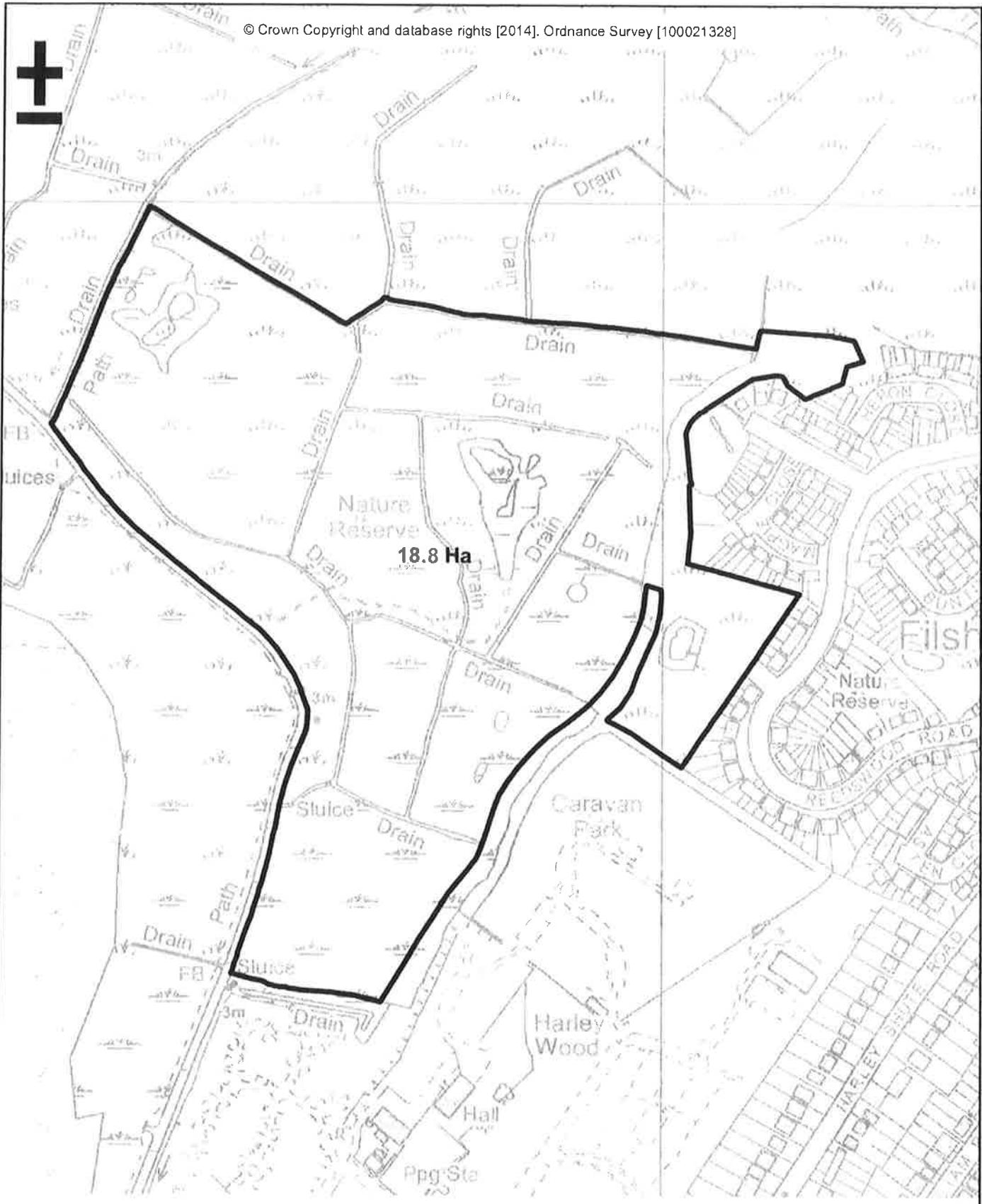
- (iii) by a constable or a member of the armed forces or of any fire brigade or ambulance service of the performance of his duty.

6. Penalty

Any person who offends against any of these byelaws shall be liable on summary conviction to a fine not exceeding Level 2 on the Standard Scale and in the case of a continuing offence to a further fine for each day during which the offence continues after the said conviction.

7. Revocation

The byelaws relating to Filsham Nature Reserve which were made by the Hastings Borough Council on the 25 July 1983 and confirmed by the Secretary of State on 12 September 1983 are hereby revoked.



Filsham Reed Beds Local Nature Reserve

MAP NR2

Date: Jul 2014	Terms and Conditions of Use of Ordnance Survey Material i) You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which Hastings Borough Council makes it available; ii) You are not permitted to copy, sub-license, distribute, sell or otherwise make available any Data to third parties in any form; and iii) Third party rights to enforce the terms of this licence shall be reserved to Ordnance Survey.	 <p>Hastings <small>gov.uk</small> Borough Council</p>
Scale: 1:4,000		

Byelaws

Hastings Country Park Nature Reserve

Hastings Borough Council – Nature Reserves

Hastings Borough Council in exercise of the powers conferred upon them by Sections 201, 21(4)² and 106³ of the National Parks and Access to the Countryside Act 1949 in accordance with Section 236 of the Local Government Act 1972 hereby make the following byelaws for the protection of the Nature Reserves at Hastings Country Park in the County of East Sussex:

1. In these byelaws

- a. "The Reserve" shall mean the pieces or parcels of land containing in the whole 342.68 hectares or thereabouts and in the County of East Sussex. Declared to be managed as a Nature Reserve by the declaration dated the 19 day of May 2006 made by the Hastings Borough Council. In pursuance of Section 19 and 21 of the National Parks and Access to the Countryside Act 1949, and the Reserve for the purposes of identification shown as nearly as may be on the map annexed to these byelaws and therein edged black.
 - b. "The Council" shall mean Hastings Borough Council.
 - c. "Firearm" shall have the same meaning as in Section 57 of the Firearms Act 1968.
2. Within the Reserve the following acts are hereby prohibited except insofar as they may be authorised by a permit issued by the Council in accordance with Byelaw 4, or are necessary to the proper execution of his duty by an officer of the Council or by any person, or servant of any person, employed or authorised by the Council.

Restriction of Access

- (i) In relation to Hastings Country Park
Entering at any time those parts of the reserve edged grey on the attached map unless using a public right of way or unless conspicuous signage indicates a permission footpath or definitive public right of way.

Damage to or disturbance of things in the Reserve

- (i) spreading or using any net, or setting or using any lamp or other instrument, or any snare or lure, for the taking, injury or destruction of any living creature.
- (ii) taking molesting or intentionally disturbing, injuring or killing any living creature.

- (iii) taking or intentionally disturbing or destroying the eggs, larvae, pupae or other immature stages, or the place used for shelter or protection of any living creature.
- (iv) intentionally removing or displacing any tree, shrub, plant, fungus or part thereof, or any unfashioned mineral thing including water.

Foot notes:

1. Amended by Natural Environment and Rural Communities (NERC) Act 2006. Telecommunications Act 1984, Water Act 1989 and Communications Act 2003.
2. Amended by the (NERC) Act 2006
3. Amended by the (NERC) Act 2006 and the Environmental Protection Act 1990

Bringing Animals into the Reserve

- (v) intentionally bringing, or permitting to be brought, into the Reserve any living creature, or the egg of any living creature, or any plant, or any seed or other part of any plant, in such circumstances that it is likely that such creature or plant will reproduce or propagate itself, or such egg will hatch, or such seed will germinate.
- (vi) bringing into, or permitting to remain within the Reserve any animal other than a dog ensuring it is kept under proper control and is prevented from worrying or disturbing any animal or bird.
- (vii) turning out any animal or poultry to feed or graze.
- (viii) exercising/flying any bird of prey.
- (ix) no person shall lead or ride any horse or pony unless it is in an area set aside and clearly signed for that purpose.

Footnote:

The Public Spaces Protection Order (No1) made under S.59 of The Anti-social Behaviour, Crime & Policing Act 2014 is in effect at Hastings Country Park Nature Reserve This order details offences in relation to dogs.

Areas of water

- (x) committing any act which pollutes or is likely to cause pollution of any water.
- (xi) obstructing any flow or any drain or watercourse.

Use of Vehicles

- (xii) driving, riding, propelling or leaving any mechanically propelled vehicle elsewhere than on a highway or on a road, or in a place indicated by a notice as being available for the purpose and not exceeding 10mph.

- (xiii) any person with an agreed permit to travel within the greater reserve shall not exceed 10mph and will drive with hazard lights on and give way to pedestrians at all times.
- (xiv) no person shall except in case of emergency or with the consent of the Council take off or land on the ground in an aircraft or hang glider.

Use of certain Equipment

- (xv) using any apparatus for the transmission, reception, reproduction or amplification of any sound, speech or images by electrical or mechanical means, except photographic equipment, apparatus designed and used as an aid to defective hearing and apparatus used in a vehicle so as not to produce sound audible by a person outside the vehicle.
- (xvi) using any device designed or adapted for detecting or locating any metal or mineral in the Reserve.

Use of firearms etc.

- (xvii) being in possession of a firearm (with ammunition suitable for use in that firearm) or discharging a firearm or lighting a firework.
- (xviii) projecting any missile manually or by artificial means.

General Prohibitions

- (xix) erecting, occupying or using any tent, caravan or other structure for the purpose of camping elsewhere than in an area indicated by a notice as being available for camping.
- (xx) flying any model aircraft.
- (xxi) erecting any post, rail, fence, pole, booth, stand, building or other structure.
 - a. neglecting to shut any gate or to fasten it if any means of doing so are provided.
 - b. climbing any locked gate or fence or accessing any clearly signed fenced/gated restricted area.
- (xxii) posting or placing any notice or advertisement.

- (xxiii) selling or offering or exposing for sale, or letting for hire or offering or exposing for letting for hire, any commodity or article, or selling or offering for sale any service.
 - a. engaging in any activity which is causing or likely to cause a disturbance.
 - b. holding any show, performance, public meeting, exhibition or sports or the playing of any organised games.
- (xxiv) Cycling other than on designated routes
- (xxv) lighting any fire, stove, heater or other appliance capable of causing a fire, elsewhere than in an area indicated by a notice as being available for BBQs.
- (xxvi) letting fall, or throwing any lighted match or lighted substance in a manner likely to cause a fire.
- (xxvii) intentionally leaving items in a place other than a receptacle provided by the Council for deposit of litter or refuse.

3. Interference with Duly Authorised Officer

Intentionally obstructing any officer of the Council or any person, or the servant of a person, employed or authorised by the Council in the execution of any works including research or scientific work connected with the laying out, maintenance or management of the Reserve.

4. Permits

- (i) the Council may issue permits authorising any person to do any act or class of acts within the Reserve or any part thereof which would otherwise be unlawful under these byelaws.
- (ii) any such permit shall be issued subject to the following conditions:
 - (a) that it must be carried whenever a visit is made to the Reserve, and produced for inspection when required by a person duly authorised by the Council in that behalf; and
 - (b) that it may be revoked by the Council at any time.

5. Byelaws

These byelaws shall not operate so as to interfere with the exercise:

- (i) by a person of

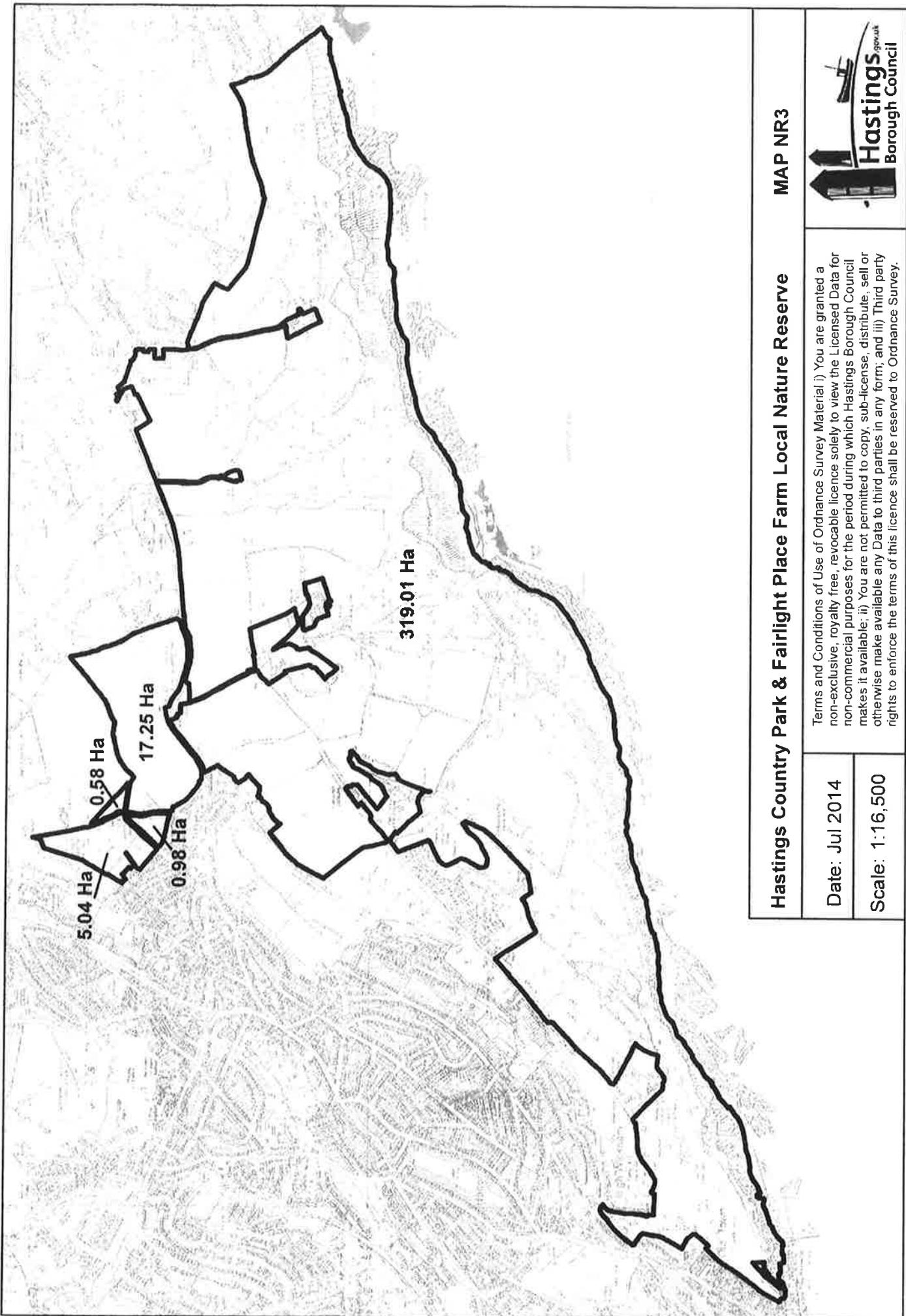
- (a) a right vested in him/her as owner, lessee or occupier of land in the reserve,
 - (b) any easement or profit à prendre to which he is entitled,
 - (c) any public right of way.
- (ii) of any functions of a local authority, statutory undertaker or drainage authority.
 - (iii) by a constable or a member of the armed forces or of any fire brigade or ambulance service of the performance of his duty.

6. **Penalty**

Any person who offends against any of these byelaws shall be liable on summary conviction to a fine not exceeding Level 2 on the Standard Scale and in the case of a continuing offence to a further fine for each day during which the offence continues after the said conviction.

7. **Revocation**

The byelaws relating to Hastings Country Park which were made under S41 of the Countryside Act 1968 on 28 June 1974 and confirmed by the Secretary of State on 4 December 1974 are hereby revoked.



Byelaws

Marline Valley Nature Reserve

Hastings Borough Council – Nature Reserves

Hastings Borough Council in exercise of the powers conferred upon them by Sections 201, 21(4)₂ and 106₃ of the National Parks and Access to the Countryside Act 1949 in accordance with Section 236 of the Local Government Act 1972 hereby make the following byelaws for the protection of the Nature Reserves at Marline Valley in the County of East Sussex:

1. In these byelaws

- a. "The Reserve" shall mean the pieces or parcels of land containing in the whole 42.2 hectares or thereabouts and in the County of East Sussex. Declared to be managed as Nature Reserve by the declaration dated the 4 day of May 1989 made by the Hastings Borough Council. In pursuance of Section 19 and 21 of the National Parks and Access to the Countryside Act 1949, and the Reserve for the purposes of identification shown as nearly as may be on the map annexed to these byelaws and therein edged black.
 - b. "The Council" shall mean Hastings Borough Council.
 - c. "Firearm" shall have the same meaning as in Section 57 of the Firearms Act 1968.
2. Within the Reserve the following acts are hereby prohibited except insofar as they may be authorised by a permit issued by the Council in accordance with Byelaw 4, or are necessary to the proper execution of his duty by an officer of the Council or by any person, or servant of any person, employed or authorised by the Council.

Damage to or disturbance of things in the Reserve

- (i) spreading or using any net, or setting or using any lamp or other instrument, or any snare or lure, for the taking, injury or destruction of any living creature.
- (ii) taking molesting or intentionally disturbing, injuring or killing any living creature.
- (iii) taking or intentionally disturbing or destroying the eggs, larvae, pupae or other immature stages, or the place used for shelter or protection of any living creature.
- (iv) intentionally removing or displacing any tree, shrub, plant, fungus or part thereof, or any unfashioned mineral thing including water.

Foot notes:

1. Amended by Natural Environment and Rural Communities (NERC) Act 2006.
Telecommunications Act 1984, Water Act 1989 and Communications Act 2003.
2. Amended by the (NERC) Act 2006
3. Amended by the (NERC) Act 2006 and the Environmental Protection Act 1990)

Bringing Animals into the Reserve

- (v) intentionally bringing, or permitting to be brought, into the Reserve any living creature, or the egg of any living creature, or any plant, or any seed or other part of any plant, in such circumstances that it is likely that such creature or plant will reproduce or propagate itself, or such egg will hatch, or such seed will germinate.
- (vi) bringing into, or permitting to remain within the Reserve any animal other than a dog ensuring it is kept under proper control and is prevented from worrying or disturbing any animal or bird.
- (vii) turning out any animal or poultry to feed or graze.
- (viii) exercising/flying any bird of prey.
- (ix) no person shall lead or ride any horse or pony unless it is in an area set aside and clearly signed for that purpose.

Footnote:

The Public Spaces Protection Order (No1) made under S.59 of The Anti-social Behaviour, Crime & Policing Act 2014 is in effect at Marline Valley Nature Reserve. This order details offences in relation to dogs.

Areas of water

- (x) committing any act which pollutes or is likely to cause pollution of any water.
- (xi) obstructing any flow or any drain or watercourse.

Use of Vehicles

- (xii) driving, riding, propelling or leaving any mechanically propelled vehicle elsewhere than on a highway or on a road, or in a place indicated by a notice as being available for the purpose and not exceeding 10mph.
- (xiii) any person with an agreed permit to travel within the greater reserve shall not exceed 10mph and will drive with hazard lights on and give way to pedestrians at all times.

Use of certain Equipment

- (xiv) using any apparatus for the transmission, reception, reproduction or amplification of any sound, speech or images by

electrical or mechanical means, except photographic equipment, apparatus designed and used as an aid to defective hearing and apparatus used in a vehicle so as not to produce sound audible by a person outside the vehicle.

- (xv) using any device designed or adapted for detecting or locating any metal or mineral in the Reserve.

Use of firearms etc.

- (xvi) being in possession of a firearm (with ammunition suitable for use in that firearm) or discharging a firearm or lighting a firework.
- (xvii) projecting any missile manually or by artificial means.

General Prohibitions

- (xviii) erecting, occupying or using any tent, caravan or other structure for the purpose of camping elsewhere than in an area indicated by a notice as being available for camping.
- (xix) flying any model aircraft.
- (xx) erecting any post, rail, fence, pole, booth, stand, building or other structure.
 - a. neglecting to shut any gate or to fasten it if any means of doing so are provided.
- (xxi) posting or placing any notice or advertisement.
- (xxii) selling or offering or exposing for sale, or letting for hire or offering or exposing for letting for hire, any commodity or article, or selling or offering for sale any service.
 - a. engaging in any activity which is causing or likely to cause a disturbance.
 - b. holding any show, performance, public meeting, exhibition or sports or the playing of any organised games.
- (xxiii) cycling, roller skating or skate boarding.
- (xxiv) lighting any fire, stove, heater or other appliance capable of causing a fire, elsewhere than in an area indicated by a notice as being available for BBQs.

(xxv) letting fall, or throwing any lighted match or lighted substance in a manner likely to cause a fire.

(xxvi) intentionally leaving items in a place other than a receptacle provided by the Council for deposit of litter or refuse.

3. **Interference with Duly Authorised Officer**

Intentionally obstructing any officer of the Council or any person, or the servant of a person, employed or authorised by the Council in the execution of any works including research or scientific work connected with the laying out, maintenance or management of the Reserve.

4. **Permits**

(i) the Council may issue permits authorising any person to do any act or class of acts within the Reserve or any part thereof which would otherwise be unlawful under these byelaws.

(ii) any such permit shall be issued subject to the following conditions:

(a) that it must be carried whenever a visit is made to the Reserve, and produced for inspection when required by a person duly authorised by the Council in that behalf; and

(b) that it may be revoked by the Council at any time.

5. **Byelaws**

These byelaws shall not operate so as to interfere with the exercise:

(i) by a person of

(a) a right vested in him/her as owner, lessee or occupier of land in the reserve,

(b) any easement or profit à prendre to which he is entitled,

(c) any public right of way.

(ii) of any functions of a local authority, statutory undertaker or drainage authority.

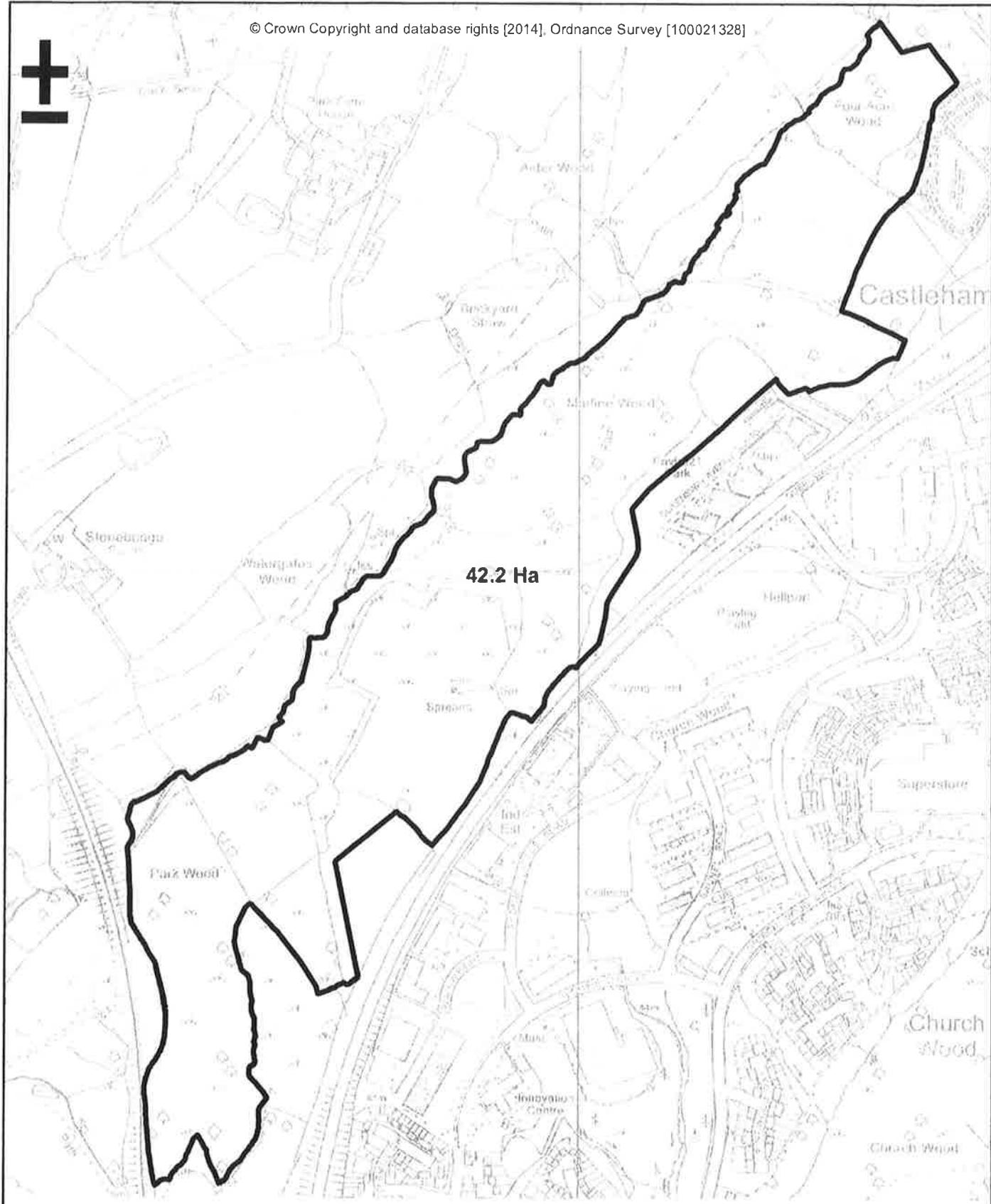
(iii) by a constable or a member of the armed forces or of any fire brigade or ambulance service of the performance of his duty.

6. **Penalty**

Any person who offends against any of these byelaws shall be liable on summary conviction to a fine not exceeding Level 2 on the Standard Scale and in the case of a continuing offence to a further fine for each day during which the offence continues after the said conviction.

7. Revocation

The byelaws relating to Marline Valley which were made on 20 November 1992 and confirmed by the Secretary of State on 12 February 1993 are hereby revoked.



Marline Valley Local Nature Reserve

MAP NR4

Date: Jul 2014

Scale: 1:7,000

Terms and Conditions of Use of Ordnance Survey Material i) You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which Hastings Borough Council makes it available; ii) You are not permitted to copy, sub-license, distribute, sell or otherwise make available any Data to third parties in any form; and iii) Third party rights to enforce the terms of this licence shall be reserved to Ordnance Survey.



Byelaws

Old Roar Gill Nature Reserve

Hastings Borough Council – Nature Reserves

Hastings Borough Council in exercise of the powers conferred upon them by Sections 201, 21(4)₂ and 106₃ of the National Parks and Access to the Countryside Act 1949 in accordance with Section 236 of the Local Government Act 1972 hereby make the following byelaws for the protection of the Nature Reserve at Old Roar Gill in the County of East Sussex:

1. In these byelaws

- a. "The Reserve" shall mean the pieces or parcels of land containing in the whole 7.6 hectares or thereabouts and in the County of East Sussex. Declared to be managed as a Nature Reserve by declarations dated the 22 day of November 2002 made by the Hastings Borough Council. In pursuance of Section 19 and 21 of the National Parks and Access to the Countryside Act 1949, and the Reserve is for the purposes of identification shown as nearly as may be on the map annexed to these byelaws and therein edged black.
 - b. "The Council" shall mean Hastings Borough Council.
 - c. "Firearm" shall have the same meaning as in Section 57 of the Firearms Act 1968.
2. Within the Reserve the following acts are hereby prohibited except insofar as they may be authorised by a permit issued by the Council in accordance with Byelaw 4, or are necessary to the proper execution of his duty by an officer of the Council or by any person, or servant of any person, employed or authorised by the Council.

Damage to or disturbance of things in the Reserve

- (i) spreading or using any net, or setting or using any lamp or other instrument, or any snare or lure, for the taking, injury or destruction of any living creature.
- (ii) taking molesting or intentionally disturbing, injuring or killing any living creature.
- (iii) taking or intentionally disturbing or destroying the eggs, larvae, pupae or other immature stages, or the place used for shelter or protection of any living creature.
- (iv) intentionally removing or displacing any tree, shrub, plant, fungus or part thereof, or any unfashioned mineral thing including water.

Foot notes:

1. Amended by Natural Environment and Rural Communities (NERC) Act 2006.
Telecommunications Act 1984, Water Act 1989 and Communications Act 2003.
2. Amended by the (NERC) Act 2006
3. Amended by the (NERC) Act 2006 and the Environmental Protection Act 1990)

Bringing Animals into the Reserve

- (v) intentionally bringing, or permitting to be brought, into the Reserve any living creature, or the egg of any living creature, or any plant, or any seed or other part of any plant, in such circumstances that it is likely that such creature or plant will reproduce or propagate itself, or such egg will hatch, or such seed will germinate.
- (vi) bringing into, or permitting to remain within the Reserve any animal other than a dog ensuring it is kept under proper control and is prevented from worrying or disturbing any animal or bird.
- (vii) turning out any animal or poultry to feed or graze.
- (viii) exercising/flying any bird of prey.
- (ix) no person shall lead or ride any horse or pony unless it is in an area set aside and clearly signed for that purpose.

Footnote:

The Public Spaces Protection Order (No1) made under S.59 of The Anti-social Behaviour, Crime & Policing Act 2014 is in effect at Old Roar Gill Nature Reserve. This order details offences in relation to dogs.

Areas of water

- (x) committing any act which pollutes or is likely to cause pollution of any water.
- (xi) obstructing any flow or any drain or watercourse.

Use of Vehicles

- (xii) driving, riding, propelling or leaving any mechanically propelled vehicle elsewhere than on a highway or on a road, or in a place indicated by a notice as being available for the purpose and not exceeding 10mph.
- (xiii) any person with an agreed permit to travel within the greater reserve shall not exceed 10mph and will drive with hazard lights on and give way to pedestrians at all times.

Use of certain Equipment

- (xiv) using any apparatus for the transmission, reception, reproduction or amplification of any sound, speech or images by electrical or mechanical means, except photographic equipment, apparatus designed and used as an aid to defective hearing and apparatus used in a vehicle so as not to produce sound audible by a person outside the vehicle.
- (xv) using any device designed or adapted for detecting or locating any metal or mineral in the Reserve.

Use of firearms etc.

- (xvi) being in possession of a firearm (with ammunition suitable for use in that firearm) or discharging a firearm or lighting a firework.
- (xvii) projecting any missile manually or by artificial means.

General Prohibitions

- (xviii) erecting, occupying or using any tent, caravan or other structure for the purpose of camping elsewhere than in an area indicated by a notice as being available for camping.
- (xix) flying any model aircraft.
- (xx) erecting any post, rail, fence, pole, booth, stand, building or other structure.
 - a. neglecting to shut any gate or to fasten it if any means of doing so are provided.
- (xxi) posting or placing any notice or advertisement.
- (xxii) selling or offering or exposing for sale, or letting for hire or offering or exposing for letting for hire, any commodity or article, or selling or offering for sale any service.
 - a. engaging in any activity which is causing or likely to cause a disturbance.
 - b. holding any show, performance, public meeting, exhibition or sports or the playing of any organised games.
- (xxiii) cycling, roller skating or skate boarding.
- (xxiv) lighting any fire, stove, heater or other appliance capable of causing a fire, elsewhere than in an area indicated by a notice as being available for BBQs.

(xxv) letting fall, or throwing any lighted match or lighted substance in a manner likely to cause a fire.

(xxvi) intentionally leaving items in a place other than a receptacle provided by the Council for deposit of litter or refuse.

3. **Interference with Duly Authorised Officer**

Intentionally obstructing any officer of the Council or any person, or the servant of a person, employed or authorised by the Council in the execution of any works including research or scientific work connected with the laying out, maintenance or management of the Reserve.

4. **Permits**

- (i) the Council may issue permits authorising any person to do any act or class of acts within the Reserve or any part thereof which would otherwise be unlawful under these byelaws.
- (ii) any such permit shall be issued subject to the following conditions:
 - (a) that it must be carried whenever a visit is made to the Reserve, and produced for inspection when required by a person duly authorised by the Council in that behalf; and
 - (b) that it may be revoked by the Council at any time.

5. **Byelaws**

These byelaws shall not operate so as to interfere with the exercise:

- (i) by a person of
 - (a) a right vested in him/her as owner, lessee or occupier of land in the reserve,
 - (b) any easement or profit à prendre to which he is entitled,
 - (c) any public right of way.
- (ii) of any functions of a local authority, statutory undertaker or drainage authority.
- (iii) by a constable or a member of the armed forces or of any fire brigade or ambulance service of the performance of his duty.
- (iv) using any device designed or adapted for detecting or locating any metal or mineral in the Reserve

6. Penalty

Any person who offends against any of these byelaws shall be liable on summary conviction to a fine not exceeding Level 2 on the Standard Scale and in the case of a continuing offence to a further fine for each day during which the offence continues after the said conviction.

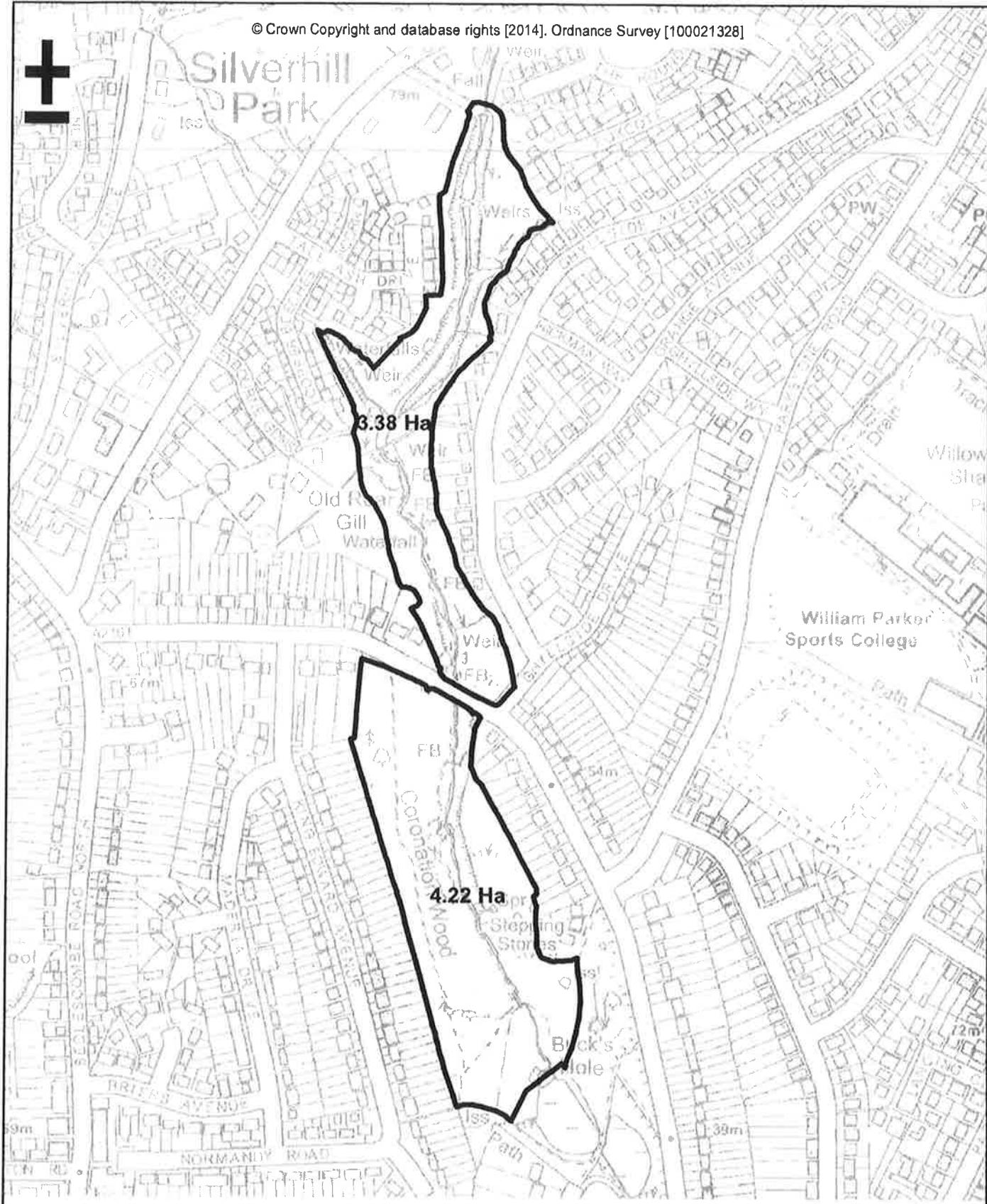


Silverhill Park

3.38 Ha

4.22 Ha

William Parker
Sports College



Old Roar Gill Local Nature Reserve

MAP NR5

Date: Jul 2014

Terms and Conditions of Use of Ordnance Survey Material i) You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which Hastings Borough Council makes it available; ii) You are not permitted to copy, sub-license, distribute, sell or otherwise make available any Data to third parties in any form; and iii) Third party rights to enforce the terms of this licence shall be reserved to Ordnance Survey.

Scale: 1:4,500



Byelaws

St Helens Wood Nature Reserve

Hastings Borough Council – Nature Reserves

Hastings Borough Council in exercise of the powers conferred upon them by Sections 201, 21(4)² and 106³ of the National Parks and Access to the Countryside Act 1949 in accordance with Section 236 of the Local Government Act 1972 hereby make the following byelaws for the protection of the Nature Reserves at St Helens Wood in the County of East Sussex:

1. In these byelaws

- a. "The Reserve" shall mean the pieces or parcels of land containing in the whole 38.79 hectares or thereabouts and in the County of East Sussex. Declared to be managed as Nature Reserve by the declaration dated the 3rd day of August 1999 made by the Hastings Borough Council. In pursuance of Section 19 and 21 of the National Parks and Access to the Countryside Act 1949, and the Reserves are for the purposes of identification shown as nearly as may be on the map annexed to these byelaws and therein edged black.
 - b. "The Council" shall mean Hastings Borough Council.
 - c. "Firearm" shall have the same meaning as in Section 57 of the Firearms Act 1968.
2. Within the Reserve the following acts are hereby prohibited except insofar as they may be authorised by a permit issued by the Council in accordance with Byelaw 4, or are necessary to the proper execution of his duty by an officer of the Council or by any person, or servant of any person, employed or authorised by the Council.

Damage to or disturbance of things in the Reserve

- (i) spreading or using any net, or setting or using any lamp or other instrument, or any snare or lure, for the taking, injury or destruction of any living creature.
- (ii) taking molesting or intentionally disturbing, injuring or killing any living creature.
- (iii) taking or intentionally disturbing or destroying the eggs, larvae, pupae or other immature stages, or the place used for shelter or protection of any living creature.
- (iv) intentionally removing or displacing any tree, shrub, plant, fungus or part thereof, or any unfashioned mineral thing including water.

Foot notes:

1. Amended by Natural Environment and Rural Communities (NERC) Act 2006.
Telecommunications Act 1984, Water Act 1989 and Communications Act 2003.
2. Amended by the (NERC) Act 2006
3. Amended by the (NERC) Act 2006 and the Environmental Protection Act 1990)

Bringing Animals into the Reserve

- (v) intentionally bringing, or permitting to be brought, into the Reserve any living creature, or the egg of any living creature, or any plant, or any seed or other part of any plant, in such circumstances that it is likely that such creature or plant will reproduce or propagate itself, or such egg will hatch, or such seed will germinate.
- (vi) bringing into, or permitting to remain within the Reserve any animal other than a dog ensuring it is kept under proper control and is prevented from worrying or disturbing any animal or bird.
- (vii) turning out any animal or poultry to feed or graze.
- (viii) exercising/flying any bird of prey.
- (ix) no person shall lead or ride any horse or pony unless it is in an area set aside and clearly signed for that purpose.

Footnote:

The Public Spaces Protection Order (No1) made under S.59 of The Anti-social Behaviour, Crime & Policing Act 2014 is in effect at St Helens Woods Nature Reserve. This order details offences in relation to dogs.

Areas of water

- (x) committing any act which pollutes or is likely to cause pollution of any water.
- (xi) obstructing any flow or any drain or watercourse.

Use of Vehicles

- (xii) driving, riding, propelling or leaving any mechanically propelled vehicle elsewhere than on a highway or on a road, or in a place indicated by a notice as being available for the purpose and not exceeding 10mph.
- (xiii) any person with an agreed permit to travel within the greater reserve shall not exceed 10mph and will drive with hazard lights on and give way to pedestrians at all times.

Use of certain Equipment

- (xiv) using any apparatus for the transmission, reception, reproduction or amplification of any sound, speech or images by electrical or mechanical means, except photographic equipment, apparatus designed and used as an aid to defective hearing and apparatus used in a vehicle so as not to produce sound audible by a person outside the vehicle.
- (xv) using any device designed or adapted for detecting or locating any metal or mineral in the Reserve.

Use of firearms etc.

- (xvi) being in possession of a firearm (with ammunition suitable for use in that firearm) or discharging a firearm or lighting a firework.
- (xvii) projecting any missile manually or by artificial means.

General Prohibitions

- (xviii) erecting, occupying or using any tent, caravan or other structure for the purpose of camping elsewhere than in an area indicated by a notice as being available for camping.
- (xix) flying any model aircraft.
- (xx) erecting any post, rail, fence, pole, booth, stand, building or other structure.
 - a. neglecting to shut any gate or to fasten it if any means of doing so are provided.
 - b. climbing any locked gate or fence or accessing any clearly signed fenced/gated restricted area.
- (xxi) posting or placing any notice or advertisement.
 - selling or offering or exposing for sale, or letting for hire or offering or exposing for letting for hire, any commodity or article, or selling or offering for sale any service.
- (xxii) engaging in any activity which is causing or likely to cause a disturbance.
- (xxiii) cycling, roller skating or skate boarding.
- (xxiv) lighting any fire, stove, heater or other appliance capable of causing a fire, elsewhere than in an area indicated by a notice as being available for BBQs.

(xxv) letting fall, or throwing any lighted match or lighted substance in a manner likely to cause a fire.

(xxvi) intentionally leaving items in a place other than a receptacle provided by the Council for deposit of litter or refuse.

3. **Interference with Duly Authorised Officer**

Intentionally obstructing any officer of the Council or any person, or the servant of a person, employed or authorised by the Council in the execution of any works including research or scientific work connected with the laying out, maintenance or management of the Reserve.

4. **Permits**

(i) the Council may issue permits authorising any person to do any act or class of acts within the Reserve or any part thereof which would otherwise be unlawful under these byelaws.

(ii) any such permit shall be issued subject to the following conditions:

(a) that it must be carried whenever a visit is made to the Reserve, and produced for inspection when required by a person duly authorised by the Council in that behalf; and

(b) that it may be revoked by the Council at any time.

5. **Byelaws**

These byelaws shall not operate so as to interfere with the exercise:

(i) by a person of

(a) a right vested in him/her as owner, lessee or occupier of land in the Reserve,

(b) any easement or profit à prendre to which he is entitled,

(c) any public right of way.

(ii) of any functions of a local authority, statutory undertaker or drainage authority.

(iii) by a constable or a member of the armed forces or of any fire brigade or ambulance service of the performance of his duty.

6. **Penalty**

Any person who offends against any of these byelaws shall be liable on summary conviction to a fine not exceeding Level 2 on the Standard Scale and in the case of a continuing offence to a further fine for each day during which the offence continues after the said conviction.

7. Revocation

The byelaws relating to St Helens Wood which were made on 31 March 1994 and confirmed by the Secretary of State on 15 June 1994 are hereby revoked.

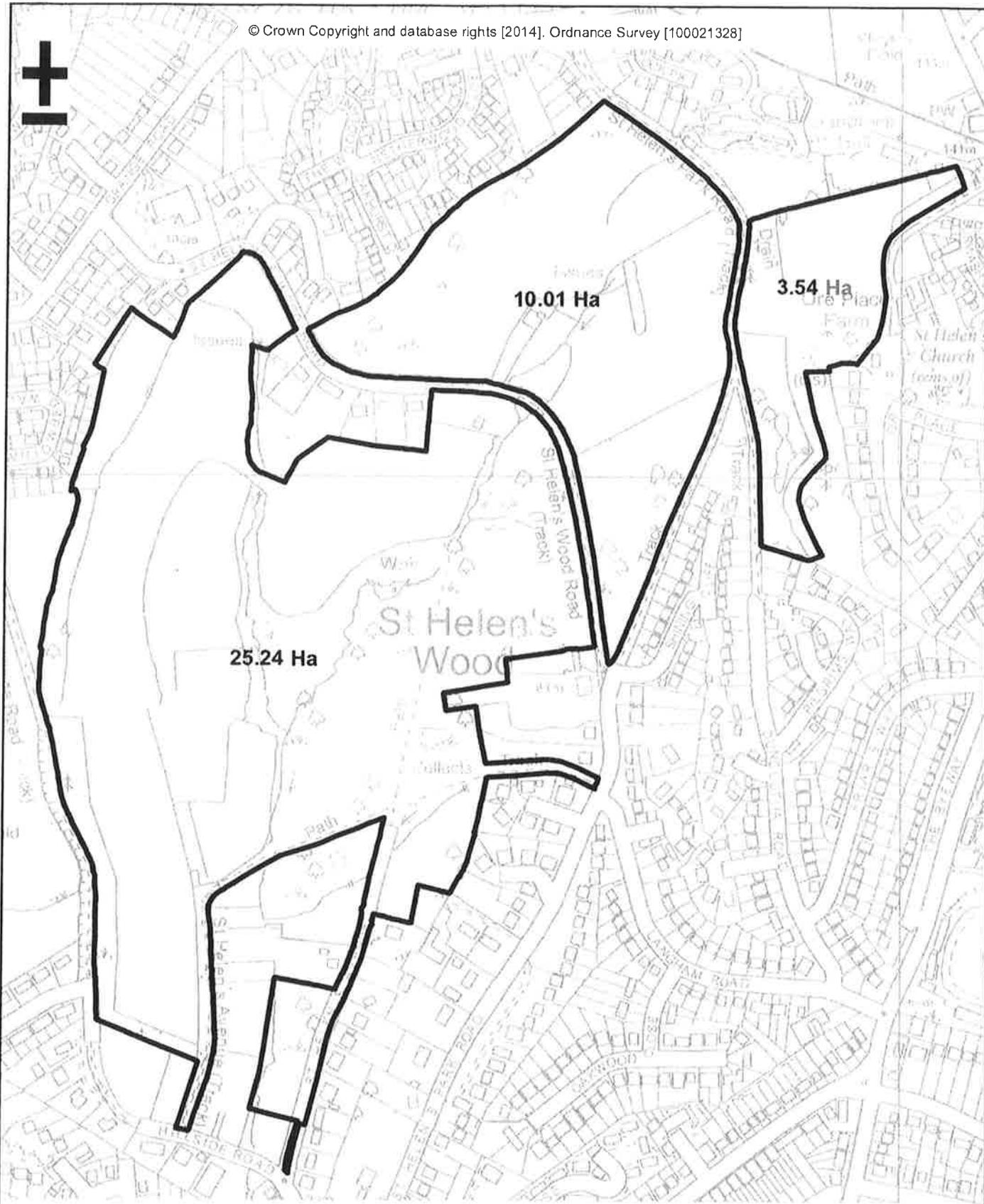


10.01 Ha

3.54 Ha

25.24 Ha

St Helen's
Wood



St Helens Woods Local Nature Reserve

MAP NR6

Date: Jul 2014

Terms and Conditions of Use of Ordnance Survey Material i) You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which Hastings Borough Council makes it available; ii) You are not permitted to copy, sub-license, distribute, sell or otherwise make available any Data to third parties in any form; and iii) Third party rights to enforce the terms of this licence shall be reserved to Ordnance Survey.

Scale: 1:5,000



Byelaws

Summerfields Nature Reserve

Hastings Borough Council – Nature Reserves

Hastings Borough Council in exercise of the powers conferred upon them by Sections 201, 21(4)² and 106³ of the National Parks and Access to the Countryside Act 1949 in accordance with Section 236 of the Local Government Act 1972 hereby make the following byelaws for the protection of the Nature Reserve at Summerfields in the County of East Sussex:

1. In these byelaws

- a. “The Reserve” shall mean the pieces or parcels of land containing in the whole 6.24 hectares or thereabouts and in the County of East Sussex. Declared to be managed as a Nature Reserve by declarations dated the 23rd day of April 2004 made by the Hastings Borough Council. In pursuance of Section 19 and 21 of the National Parks and Access to the Countryside Act 1949, and the Reserve is for the purposes of identification shown as nearly as may be on the map annexed to these byelaws and therein edged black.
 - b. “The Council” shall mean Hastings Borough Council.
 - c. “Firearm” shall have the same meaning as in Section 57 of the Firearms Act 1968.
2. Within the Reserve the following acts are hereby prohibited except insofar as they may be authorised by a permit issued by the Council in accordance with Byelaw 4, or are necessary to the proper execution of his duty by an officer of the Council or by any person, or servant of any person, employed or authorised by the Council.

Damage to or disturbance of things in the Reserve

- (i) spreading or using any net, or setting or using any lamp or other instrument, or any snare or lure, for the taking, injury or destruction of any living creature.
- (ii) taking molesting or intentionally disturbing, injuring or killing any living creature.
- (iii) taking or intentionally disturbing or destroying the eggs, larvae, pupae or other immature stages, or the place used for shelter or protection of any living creature.
- (iv) intentionally removing or displacing any tree, shrub, plant, fungus or part thereof, or any unfashioned mineral thing including water.

Foot notes:

1. Amended by Natural Environment and Rural Communities (NERC) Act 2006. Telecommunications Act 1984, Water Act 1989 and Communications Act 2003.
2. Amended by the (NERC) Act 2006
3. Amended by the (NERC) Act 2006 and the Environmental Protection Act 1990)

Bringing Animals into the Reserve

- (v) intentionally bringing, or permitting to be brought, into the Reserve any living creature, or the egg of any living creature, or any plant, or any seed or other part of any plant, in such circumstances that it is likely that such creature or plant will reproduce or propagate itself, or such egg will hatch, or such seed will germinate.
- (vi) bringing into, or permitting to remain within the Reserve any animal other than a dog ensuring it is kept under proper control and is prevented from worrying or disturbing any animal or bird.
- (vii) turning out any animal or poultry to feed or graze.
- (viii) exercising/flying any bird of prey.
- (ix) no person shall lead or ride any horse or pony unless it is in an area set aside and clearly signed for that purpose.

Footnote:

The Public Spaces Protection Order (No1) made under S.59 of The Anti-social Behaviour, Crime & Policing Act 2014 is in effect at Summerfields Nature Reserve. This order details offences in relation to dogs.

Areas of water

- (x) committing any act which pollutes or is likely to cause pollution of any water.
- (xi) obstructing any flow or any drain or watercourse.

Use of Vehicles

- (xii) driving, riding, propelling or leaving any mechanically propelled vehicle elsewhere than on a highway or on a road, or in a place indicated by a notice as being available for the purpose and not exceeding 10mph.
- (xiii) any person with an agreed permit to travel within the greater reserve shall not exceed 10mph and will drive with hazard lights on and give way to pedestrians at all times.

Use of certain Equipment

- (xiv) using any apparatus for the transmission, reception, reproduction or amplification of any sound, speech or images by electrical or mechanical means, except photographic equipment, apparatus designed and used as an aid to defective hearing and apparatus used in a vehicle so as not to produce sound audible by a person outside the vehicle.
- (xv) using any device designed or adapted for detecting or locating any metal or mineral in the Reserve.

Use of firearms etc.

- (xvi) being in possession of a firearm (with ammunition suitable for use in that firearm) or discharging a firearm or lighting a firework.
- (xvii) projecting any missile manually or by artificial means.

General Prohibitions

- (xviii) erecting, occupying or using any tent, caravan or other structure for the purpose of camping elsewhere than in an area indicated by a notice as being available for camping.
- (xix) flying any model aircraft.
- (xx) erecting any post, rail, fence, pole, booth, stand, building or other structure.
 - a. neglecting to shut any gate or to fasten it if any means of doing so are provided.
- (xxi) posting or placing any notice or advertisement.
- (xxii) selling or offering or exposing for sale, or letting for hire or offering or exposing for letting for hire, any commodity or article, or selling or offering for sale any service.
 - a. engaging in any activity which is causing or likely to cause a disturbance.
 - b. holding any show, performance, public meeting, exhibition or sports or the playing of any organised games.
- (xxiii) cycling, roller skating or skate boarding.
- (xxiv) lighting any fire, stove, heater or other appliance capable of causing a fire, elsewhere than in an area indicated by a notice as being available for BBQs.

- (xxv) letting fall, or throwing any lighted match or lighted substance in a manner likely to cause a fire.
- (xxvi) intentionally leaving items in a place other than a receptacle provided by the Council for deposit of litter or refuse.

3. Interference with Duly Authorised Officer

Intentionally obstructing any officer of the Council or any person, or the servant of a person, employed or authorised by the Council in the execution of any works including research or scientific work connected with the laying out, maintenance or management of the Reserve.

4. Permits

- (i) the Council may issue permits authorising any person to do any act or class of acts within the Reserve or any part thereof which would otherwise be unlawful under these byelaws.
- (ii) any such permit shall be issued subject to the following conditions:
 - (a) that it must be carried whenever a visit is made to the Reserve, and produced for inspection when required by a person duly authorised by the Council in that behalf; and
 - (b) that it may be revoked by the Council at any time.

5. Byelaws

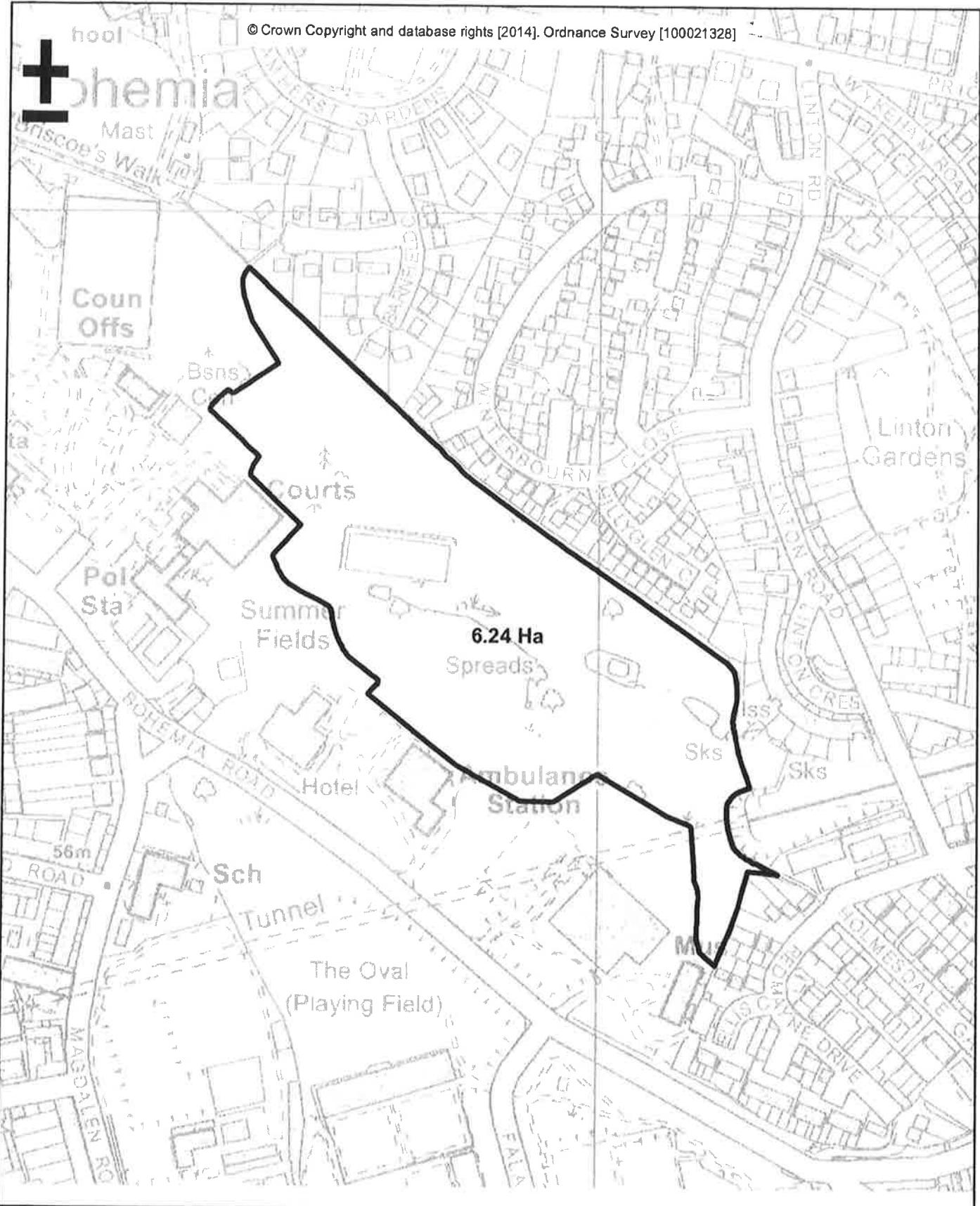
These byelaws shall not operate so as to interfere with the exercise:

- (i) by a person of
 - (a) a right vested in him/her as owner, lessee or occupier of land in the Reserve,
 - (b) any easement or profit à prendre to which he is entitled,
 - (c) any public right of way.
- (ii) of any functions of a local authority, statutory undertaker or drainage authority.
- (iii) by a constable or a member of the armed forces or of any fire brigade or ambulance service of the performance of his duty.
- (iv) using any device designed or adapted for detecting or locating any metal or mineral in the Reserve.

(v) projecting any missile manually or by artificial means.

6. Penalty

Any person who offends against any of these byelaws shall be liable on summary conviction to a fine not exceeding Level 2 on the Standard Scale and in the case of a continuing offence to a further fine for each day during which the offence continues after the said conviction.



Summerfields Woods Local Nature Reserve

MAP NR7

Date: Jul 2014

Terms and Conditions of Use of Ordnance Survey Material i) You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which Hastings Borough Council makes it available; ii) You are not permitted to copy, sub-license, distribute, sell or otherwise make available any Data to third parties in any form; and iii) Third party rights to enforce the terms of this licence shall be reserved to Ordnance Survey.

Scale: 1:3,500



This page is intentionally left blank

Agenda Item 5



Report to: Cabinet

Date of Meeting: 3rd February 2020

Report Title: Pay Policy Statement 2020/21

Report By: Jane Hartnell – Director of Corporate Services and Governance

Purpose of Report

The purpose of the report is for approval of the Pay Policy Statement for 2020/2021, as required by the Localism Act 2011.

Recommendation(s)

1. Recommendation of the pay policy statement to full council for approval

Reasons for Recommendations

The Localism Act 2011 requires Hastings Borough Council to prepare and publish an annual pay policy statement. The purpose of such a statement is to provide information about Council policies on a range of issues relating to the pay of its workforce, particularly its senior staff and its lowest paid employees. A Pay Policy must be prepared for each financial year and must be approved by Full Council, and published

Introduction

1. The Localism Act 2011 requires Hastings Borough Council to prepare and publish a pay policy statement for each financial year.
2. The attached statement (Appendix 1) sets out the key policy principles that underpin the Council's requirements to provide accountability under the Localism Act. It takes into account and has due regard to guidance issued by the Department of Communities and Local Government.
3. The majority of the statement reflects current policy, practice and procedures adopted by the Council and it is cross referenced to other documents including the Council's severance scheme and transparency requirements.

Timetable of Next Steps

4. Please include a list of key actions and the scheduled dates for these:

Action	Key milestone	Due date (provisional)	Responsible
No further action required	To be reviewed annually	January 2021	Verna Connolly

Wards Affected

Insert the list of wards affected

Implications

Relevant project tools applied? No

Have you checked this report for plain English and readability? Yes

Climate change implications considered? Yes

Please identify if this report contains any implications for the following:

Equalities and Community Cohesiveness	Yes
Crime and Fear of Crime (Section 17)	No
Risk Management	No
Environmental Issues	No

Economic/Financial Implications **Yes**
There are no additional financial implications arising from the report as resultant costs can be contained within existing budgets.

Human Rights Act	No
Organisational Consequences	Yes
Local People's Views	No
Anti-Poverty	No

Additional Information

Appendix 1 – Pay Policy Statement 2020/21

Officer to Contact

Officer Name	Verna Connolly
Officer Email Address	vconnolly@hastings.gov.uk
Officer Telephone Number	01424 451707

This page is intentionally left blank

Appendix 1

Hastings Borough Council

Pay Policy Statement for the year 1 April 2020 to 31 March 2021

Introduction

1. This pay policy statement under section 38 of the Localism Act 2011 shall apply for the financial year 2020 - 2021 until amended.
2. The purpose of the statement is to provide transparency with regard to the Council's approach to setting the pay of its employees by identifying:
 - the methods by which remuneration of all employees are determined, including the remuneration of its most senior staff;
 - the arrangements for ensuring the provisions set out in this statement are applied consistently throughout the Council.
3. This statement applies to all employees under the following conditions of employment:

JNC for Chief Officers of Local Authorities
NJC for Local Government Services

4. The council defines its senior management as :
Corporate Directors
Assistant Directors
General Managers/Professional leads who are directly accountable to a statutory or non statutory officer in respect of all or most of their duties (excluding roles which are clerical or secretarial). Such officers are invited to provide expertise in their role as head of their profession.
5. This Pay Policy will operate subject to any requirements regarding exit payments pursuant to the Enterprise and the Small Business, Enterprise and Employment Act, 2015 and associated regulations.

The Council's policies for setting remuneration

6. In determining its grading structure and setting remuneration levels for all posts, the Council takes account of the need to ensure value for money in respect of the use of public expenditure, balanced against the need to recruit and retain employees who are able to meet the requirements of providing high quality services to the community, delivered effectively and efficiently and at times at which those services are required.
7. With the exception of Directors and Assistant Directors, the Council uses the nationally negotiated pay spine as the basis for its local grading structure. The grade of a post is determined by application of an agreed Job Evaluation process. The value of scale points changes in line with national agreements, including any "cost of living" increases, the most recent of these at the time of preparation of this policy, was a 2% increase effective from 1st April 2019.

Grade and Salary Band (from 1st April 2019)

Grade	Salary Band
11*	£17,771 to £18,795
10	£18,795 to £19,945
9	£19,171 to £21,589
8	£20,344 to £23,836
7	£22,462 to £26,317
6	£24,799 to £29,636
5	£27,905 to £32,878
4	£31,371 to £35,934
3	£33,799 to £39,782
2	£38,813 to £44,632
1	£43,662 to £50,369

* Lowest hourly rate is £9.00. Accredited living wage at time of preparation of this statement will increase to £9.30 it is therefore anticipated that the nationally negotiated pay spine will be increased to reflect this.

- As we are committed to paying the Accredited Living Wage all Apprentices will be paid at this rate.
8. All other pay-related allowances are the subject of either nationally or locally negotiated rates, having been determined from time to time in accordance with collective bargaining machinery and/or as determined by Council policy.
 9. New appointments will normally be made at the minimum of the relevant grade, although this can be varied where necessary to secure the best candidate. From time to time it may be necessary to take account of the external pay market in order to attract and retain employees with particular experience, skills and capacity. Where possible, the Council will ensure the requirement for such approaches is objectively justified by reference to clear and transparent evidence of relevant market comparators, using appropriate data sources available from within and outside the local government sector.
 10. There are a number of pay points within each grade. For staff not on the highest point within the band, there is a system of annual progression to the next point on the band. Faster progression is possible for posts identified and evaluated as career grades.
 11. With regard to the equal pay requirements of the Equality Act 2010, the Council ensures there is no pay discrimination within its pay structures and that all pay differentials can be objectively justified through the use of equality proofed Job Evaluation mechanisms which directly relate salaries to the requirements, demands and responsibilities of the role.

Chief Officer Grade Range pay rate (officers who are JNC Chief Officers Terms and conditions of employment)

12. Chief Officer pay range is £77,706 to £85,745 (value at 1st April 2019)

Chief Officers

13. The Council's policy and procedures with regard to recruitment of Chief Officers are set out in the Officer Employment Procedure Rules in Part 4, Section 30 of the Council's Constitution. The

determination of the remuneration to be offered to any newly appointed chief officer will be in accordance with this pay policy statement and other relevant policies in place at the time of recruitment. In the case of recruitment of Directors and Assistant Directors, the decision on remuneration will be taken by the Employment Committee. Any appointments at this level offering a salary in excess of £100,000 would require approval by Full Council. Where the Council is unable to recruit to a post at the designated grade, it may consider the use of temporary market forces supplements in accordance with its relevant policies.

14. Where the Council remains unable to recruit Directors or Assistant Directors under a contract of service, or there is a need for interim support to provide cover for a vacant substantive Director or Chief Officer post, the Council will, where necessary, consider engaging individuals under 'contracts for service'. These will be sourced through a relevant procurement process ensuring the council is able to demonstrate value for money from competition in securing the relevant service.

Additional payments

15. In addition to the basic salary for the post, staff are or may be eligible for other payments under the Council's existing policies. Some of these payments are chargeable to UK Income Tax and do not solely constitute reimbursement of expenses incurred in the fulfilment of duties:

Lease car provision, the Council no longer offers subsidised lease cars to new employees. A small number of staff remain eligible under historical contracts of employment;

Benefits allowance, employees who are not entitled to a lease car but are required to travel in order to carry out their duties may receive a benefits allowance to cover motor costs of travel including mileage except for journeys over 50 miles.

Reimbursement of mileage, Employees can claim mileage travelled in the course of council business. Hastings Borough Council mileage rates are paid dependant on which scheme the employee is in.

This could be:-

NJC rates which are based on the engine size, fuel type for protected employees in post prior to 27th November 2001

HMRC Company Advisory Fuel Rates for lease cars.

HMRC Approved Mileage Rates for all other employees. Passenger rate is also paid if appropriate;

Professional fees. The Council will meet the cost of a legal practicing certificate for all those employees where it is a requirement of their employment; and professional body subscriptions for staff who are studying providing sponsorship has been agreed by the Council.

Long service awards. The Council allows staff to purchase a gift to a maximum amount if they have completed 25 years of service;

Honoraria, in accordance with the Council's policy on salary and grading. Generally, these may be paid only where a member of staff has performed a role at a higher grade. Deputy returning officers are paid an honorarium.

Fees for returning officer and other electoral duties, such as acting as a presiding officer of a polling station, excluding deputy returning officers. These are fees which are identified and paid separately for local government elections, elections to the UK Parliament and EU Parliament and other electoral processes such as referenda;

Pay protection, where a member of staff is placed in a new post and the grade is one grade below that of their previous post, for example as a result of a restructuring, pay protection at the level of their previous post is paid for the first 18 months;

Childcare vouchers are available to all eligible employees via the HMRC-approved salary sacrifice scheme. There is no direct subsidy towards childcare costs by the Council;

Standby and/or call-out payments, employees who are required to be on standby at times which are outside their normal working week and/or who may be called-out to attend to an issue at the Council's premises or other location may receive an additional payment in accordance with the provisions of the relevant Council policy;

Provision of mobile telephones, mobile telephones are provided to employees on the basis of business need where they are necessary to enable them to undertake their duties effectively. The Council funds the provision of the phone and business calls.

Discounted loans, permanent employees who have satisfactorily completed their probationary period have access to discounted loans for:

- The purchase of cars/bicycles; and/or
- The purchase of season tickets for travel;

Interest is charged on Car and Bicycle loans at current PWLB (Public Works Loan Board) rates plus 1.25%. For a small number of employees employed before 27th November 2001 no interest is chargeable under historical contract of employment terms. Travel season ticket loans are interest free;

Employee assistance programme, is a 24/7 confidential support service for information and guidance on a range of work-life topics funded by the Council and made available to all staff.

Lifestyle scheme is an online benefits scheme that works with well-known retailers, both online and on the high street, to provide market-leading offers and discounts to all staff.

Performance-related pay and bonuses

16. The Council does not operate a scheme of performance-related pay or bonuses for its staff.

Lowest-paid employees

17. The Council's definition of lowest-paid employees is people employed in Grade 11 of the Council's grading structure. This is because it is the lowest pay band operated by the Council for permanent staff. Hastings Borough Council ensures its lowest paid employees are paid the current published UK Accredited Living Wage or higher.

Relationship between remuneration of chief officers and remuneration of employees who are not chief officers

18. The Council's ratio of pay at the top, to pay at the median is currently 1:3.4. The Council will look to ensure the ratio does not exceed the national average for the public sector. This ratio is based on basic salary only, excluding variable pay and benefit in kind.

Payments on termination etc.

19. The Council's approach to statutory and discretionary payments on termination of employment is set out within its Early Termination of Employment – Compensation Policy which includes the

written statement in accordance with regulations 5 and 6 of the Local Government (Early Termination of Employment) (Discretionary Compensation) Regulations 2006. At the time of preparation of this policy statement, the policy is:

- to pay statutory redundancy payments in accordance with the Employment Relations Act 1998, which provides for a maximum calculation of up to 30 weeks' pay, multiplied by two. The payment will be based on an employee's actual weekly salary rather than the figure set by the Government.
20. The Council's policy is normally not to make any awards under the Local Government (Discretionary Payments) (Injury Allowances) Regulations 2011: this constitutes its written policy statement under the regulations.
21. Any large severance payments will be considered by the Employment Committee and referred to full Council for approval. Large payments would be those in excess of £95,000 including salary paid in lieu, redundancy compensation, pension entitlements, holiday pay and any bonuses, fees or allowances paid. The basis of any exit payment is subject to a maximum salary of £80,000.
22. Employees re-employed by a relevant body, as specified in the Modification Order, within 12 months of receiving of an exit payment in excess of £80,000 will be required to repay an amount of the payment. Tapering provisions will be implemented using Government guidelines when they become available.

Publication of information

23. This statement will be published on the Council's Website www.hastings.gov.uk. In accordance with regulation 7 of the Accounts and Audit (England) Regulations 2011, for posts where the remuneration in a year is £50,000 or more, the Council's Annual Statement of Accounts will include a note setting out the total amount of - salary, fees or allowances paid to or receivable by the person in the current and previous year;
- any sums payable by way of expenses allowance that are chargeable to UK income tax;
 - any compensation for loss of employment and any other payments connected with termination;
 - any benefits received that do not fall within the above

The statement of accounts is available on the Council's website.

24. The Council also publishes information about remuneration of JNC Chief Officers and staff in the transparency section of its website.
http://www.hastings.gov.uk/my_council/transparency/
- This information is updated from time to time and includes a list of Directors and Assistant Directors as defined in the Localism Act 2011.

This page is intentionally left blank

Agenda Item 6



Report to: Cabinet

Date of Meeting: 3 February 2020

Report Title: Review of HMO Licensing Fees

Report By: Andrew Palmer, Assistant Director Housing and Built Environment

Purpose of Report

The high court case of R (Gasking) v Richmond-upon-Thames London Borough Council has held that licensing schemes made under the Housing Act 2004 are authorisation schemes within the meaning of the EU services directive. This has necessitated a re-assessment of the fees charged for the councils HMO licensing scheme.

Recommendation(s)

1. That Cabinet approve the revised fee structure for HMO licensing to take into account a 'Hemmings' (two part) fee structure.
2. That the revised fee structure in appendix 1 is introduced on 1 April 2020

Reasons for Recommendations

In order to comply with the provisions of the services directive housing licence fees are required to be charged in two parts. As the Council is presently consulting on a new Selective Licensing scheme (Housing Act 2004 Part 3) to replace the existing scheme in October 2020 which includes details on two part fees for this scheme this report only proposes changing the HMO Licensing Scheme (Housing Act 2004 Part 2) fees in April 2020.

Introduction

1. On 31 July 2018, the High Court, as a result of *R (Gaskin) v Richmond-upon-Thames LBC [2018] EWHC 1996 (Admin)*, held that schemes for the licensing of houses in multiple occupation ('HMOs') under Part 2 of the Housing Act 2004 ('the 2004 Act') are authorisation schemes, within the meaning of EU Directive 2006/123/EC ('the Directive') and regulations incorporating the Directive in domestic law: the Provision of Services Regulations 2009 ('the 2009 Regulations').
2. The consequence of the above decision is that the fee for an HMO licence under Part 2 of the 2004 Act and for a licence to let other accommodation under Part 3, must be levied in two, separate parts, in accordance with the type A scheme endorsed by the Supreme Court in *R (Hemming, t/a Simply Pleasure Ltd) v Westminster CC [2015] UKSC 25; [2015] AC 1600* (referred to as a 'Hemmings' fee structure);
 - Part 1 – a fee levied at the point of application, to cover the costs of the scheme's 'authorisation procedures and formalities', i.e. the costs of processing the application; and
 - Part 2 – if the application is successful, a further fee to cover the costs of running and enforcing the scheme.
3. In July 2017 the Local Government Association published guidance to help councils understand the breadth of the issues that need to be considered when setting local licence fees. This guidance made reference to Hemmings but as the outcome of the Gaskin case was still outstanding it was unconfirmed at that time whether the guidance applied in full to housing licensing. In addition to setting out how a two part application fee may be levied it clarified that using a surplus from one licensing scheme to subsidise another or for any fee income to be drawn into the council's general fund is unlawful.
4. The present fee structure for the mandatory licensing of certain categories of HMOs, and the discretionary additional HMO and selective licensing schemes in Hastings are not currently a 'Hemming' two part fee structure. Following the Gaskin case therefore it is now appropriate to consider all the councils Housing Act 2004 licensing fees in light of the LGA guidance.

Hastings Selective Licensing Scheme 2015

5. The present Selective Licensing Scheme (which commenced in October 2015) is due to cease in October 2020. To date this scheme has received over 8,000 applications. Although applications are still being received for this scheme the rate is now much reduced and is expected to continue at this low level until the end of the scheme.
6. The Council is presently consulting on a new scheme to replace the existing scheme from October 2020. The consultation for the new scheme includes details on a 'Hemmings' two part fee. It is not proposed that the council amend the existing fees for the Selective Licensing 2015 scheme and that a single fee is retained until the end of the scheme in October 2020.

Hastings Additional HMO Licensing Scheme 2018

7. The new additional HMO licensing scheme commenced in April 2018. The fees for this scheme were based on the experience of administering the previous additional HMO licencing scheme (which ceased in September 2016).
8. The present fee structure for the additional HMO licensing scheme is consistent with the fee structure for mandatory HMO licensing that being £ 400 per application unless the HMO was previously unlicensed when the fee rises to £ 1,000. A selective licensing surcharge may also be payable if one or more of the units of accommodation in the HMO required a selective licence prior to the building becoming a licensable HMO.
9. When the new additional scheme was adopted the fees for those HMO's required to be licenced as mandatory under the Housing Act were also amended to be consistent to the additional scheme.
10. Since the beginning of the 2018 HMO licensing scheme we have received 489 applications and issued 303 licences. As opposed to the selective scheme a number of HMO licenses have been granted for less than the maximum 5 year term and as such there are renewal fees payable within this scheme.

'Hemmings' Fee Structure

11. A review of the HMO licensing scheme costs in Hastings has been undertaken to attempt to identify what the Part A and Part B fees would be. The Part A fee covers the actual time taken to receive and process a licence to decision (grant or refuse). This fee can be charged on application as the present fee is. The Part B fee covers the cost of maintaining the wider schemes (such as ICT costs, management overheads) and any enforcement costs. The Part B fee can only be charged when licences are approved (if a licence is refused the Part B fee cannot be charged but the Part A fee can be retained).
12. A breakdown of the calculation of the fees is included in appendix 2. In summary;

Part 2 HMO Licensing (inc. Mandatory and Additional)					
New Application	Part A Fee	Part B Fee	Total Fee	Previous Fee (unlicensed)	Difference
	£ 414	£ 566	£ 980	£ 1,000	-2%
Renewal Application	Part A Fee	Part B Fee	Total Fee	Previous Fee (licenced)	Difference
	£ 414	Nil	£ 414	£ 400	+3%

Financial impact of proposed fee structure

13. Based upon the modelling we have so far undertaken, the new fee structure proposed for HMO licensing might result in a small net increase in income received in respect of the councils HMO licencing scheme operating costs over the remaining

4 years of the scheme. However, this should be treated with caution as it is based on an assumption of the number of applicants that renew promptly (and receive the £ 414 renewal fee as opposed to being treated as a new applicant and being charged £ 980). It is also assumed in this estimate that all Part B fees will be paid by landlords once they have received their licence which from previous experience of charging upon grant of licence in the previous licensing scheme is not always the case.

14. Another outcome of the Hemmings case was it made clear that local authorities must not utilise surplus fee income from one licensing scheme to fund other council activities. Fees are required to be kept under constant review and should the scheme look to be operating at a deficit at the end of its five year duration the expenditure of the scheme will be reduced accordingly. Conversely if, at review, the scheme appears to be operating in surplus consideration will need to be made in respect of refunding landlords a proportion of their fees.

Operational impact of proposed fee structure

15. Following the experience of the 2014 Additional HMO Licensing Scheme (which was predominantly paper based) the 2018 Additional HMO Licensing Scheme was introduced through an online only application process to keep the cost of the applications to landlords as low as possible. The introduction of the 2 part fee process means the full fee cannot be charged up front at application and therefore upon grant of licence an invoice is required to be raised and sent with the licence approval documentation.
16. Licence fees for the old 2014 Additional HMO Licensing Scheme were payable in full upon grant of licence. In some instances landlords did not continue to pay invoices sent out with licences leaving the authority in the position whereby a licence had been granted but the fee remained unpaid. As the licence had been issued the landlord could not be pursued under the Housing Act and non-payment of the fee could only be recovered through normal debt recovery processes.
17. A move to a 2 part application will require a full reassessment of the application process, including updating the online application form. In particular effort will be required to combat the issue of landlords avoiding paying part B fees when they have received their licence.

Risks

18. Neither the MHCLG nor the LGA have issued any specific guidance on fee setting for licensing schemes made under the Housing Act. The adoption on a 'Hemmings' fee structure nationally is sporadic. Locally most Sussex authorities have amended their fee structure and the remainder are planning to do so from April 2020.
19. Should the council not adopt a 2 part fee structure there is a risk of legal challenge from landlords. While there is still a significant amount of time to run on the HMO licensing scheme it is appropriate to adopt the fee structure for this scheme however the risk of challenge with regards to the selective licensing scheme is reduced significantly due to the fact this scheme is nearing its natural end.

Timetable of Next Steps

Action	Key milestone	Due date (provisional)	Responsible
New fee introduced	Adaption of online application form and associated procedures	1 April 2020	Matthew China

Wards Affected

Braybrooke, Castle, Gensing, Ore, Old Hastings, Tressell, Central St Leonards

Implications

Relevant project tools applied? Yes/No – not relevant

Have you checked this report for plain English and readability? Yes/No – Readability score of 41.0

Climate change implications considered? Yes/No – not relevant

Please identify if this report contains any implications for the following:

Equalities and Community Cohesiveness

Crime and Fear of Crime (Section 17)

Risk Management

Environmental Issues

Economic/Financial Implications – As detailed in the report at paragraphs 14 and 15

Human Rights Act

Organisational Consequences – As detailed in the report at paragraphs 16 to 18

Local People's Views

Anti-Poverty

Additional Information

Appendix 1 – Proposed fee structure for licensing under Housing Act 2004

Appendix 2 – Fee calculation background

Officer to Contact

Matthew China

mchina@hastings.gov.uk

01424 451357

Appendix 1 – HMO Licensing (Housing Act 2004 Part 2) Schedule of Fees

The following fees are not liable to VAT. Renewal application is only applicable if application to renew is made within 3 months of the expiration of the previous licence. Any application outside these 3 months will be treated as a new application.

Licenses are non-transferable. Any new owner is required to make a new application

Housing Act 2004 Part 2 (HMO) – New Application

Part A Fee (payable on application) - £ 414

Part B Fee (payable within 14 days of grant of licence) - £ 566

Housing Act 2004 Part 2 (HMO) – Renewal Application

Part A Fee (payable on application) - £ 414

Part B Fee (payable within 14 days of grant of licence) - £ Nil

Miscellaneous Fees

Surcharge for Part 2 Additional HMO Licence where applicant owns units of accommodation within the HMO that do not have an extant existing Part 3 Selective Licence under the Hastings Borough Council Selective Licensing Scheme 2015 - £ 665 per dwelling

Fee for assistance in making application - £ 50 per application

Discount for charities registered with the Charity Commission in England and Wales – 100%

Appendix 2 – Fee Calculations

PART A

	Time taken (mins)	Who (A/O/M)	Cost £
Application process:			
Application verified	60	A	16.81
Correspondence on declarations	120	A	33.62
Draft licence prep	120	A	33.62
Draft licence checked	60	O	28.21
Land registry (average 3 searches)			9.00
Draft licence distribution	60	A	16.81
Prepare representations report	120	A	33.62
Review representations	60	O	28.21
Review representations	60	M	43.63
Prepare final licence	60	O	28.21
Check final licence	30	M	21.82
Inspection:			
Inspection prep	120	O	56.42
Inspection	120	O	56.42
Associated costs:			
Virtual mailroom	Total cost	6000	7.50
PART A TOTAL			413.90

	Hourly rate inc on costs	
A Admin	16.81	
O Officer	28.21	
M Manager	43.63	

	Part A	Part B	Total
£ 414	£ 566	£ 980	

Number of licences issued by authority	800
--	-----

PART B

Enforcement costs:			
Identification of unlicensed properties (0.5FTE)	46620	O	21,919.17
Determination of enforcement action (0.01FTE)	932.4	M	678.01
Advice on licensing need (1FTE)	93240	A	26,122.74
Associated costs:			
Maintenance of scheme - including complaint investigation (0.1FTE)	9324	M	6,780.10
Annual scheme review (5 days)	2250	M	1,636.13
Final scheme review (15 days)	6750	m	4,908.38
Software licence costs	Total cost	3,000.00	
ICT Equipment	Total cost	7,000.00	
Officer training and CPD (£ 500 per officer per year)	Total cost	7,500.00	
Scheme development / consultation	Total cost	20,000.00	
Online application form cost	Total cost	35,000.00	
Publicity / advertising (inc. formal adoption notices)	Total cost	18,000.00	
Legal support charges	Total cost	50,000.00	
Corporate support costs (inc. legal and finance)	Total cost	250,000.00	
Total		452,544.52	
PART B TOTAL			565.68

This page is intentionally left blank