Chatsworth Blue Haze Landfill

Flood Risk and Surface Water Drainage Assessment

784-B054837

For Planning

Veolia

February 2024

Document prepared on behalf of Tetra Tech Limited.

Registered in England number: 01959704

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1.0 INTRODUCTION

1.1 PURPOSE OF THIS REPORT

1.1.1 Tetra Tech has been commissioned by Veolia to prepare a Flood Risk Assessment (FRA) to support the planning application for the proposed temporary installation of an Incinerator Bottom Ash (IBA) facility at Chatsworth Blue Haze Landfill, Ringwood, Hants, BH24 3QE.

1.2 SCOPE OF THIS REPORT

1.2.1 The FRA will be undertaken in accordance with the National Planning Policy Framework, (NPPF), Planning Practice Guidance (PPG), (Flood Risk and Coastal Change), Environment Agency guidance, and relevant local planning policy and Local Authority documents.

1.2.2 The FRA will consider all potential sources of flood risk including Main Rivers, Ordinary Watercourses, surface water and overland flow routes, groundwater, sewers, and reservoirs and recommend appropriate mitigation to ensure the proposed scheme is safe from flooding over its design life and does not result in an increase in flood risk elsewhere.

1.3 LIMITATIONS OF THIS REPORT

1.3.1 This report has been prepared by Tetra Tech Ltd on behalf of Veolia in connection with the scope of the report as described in Section 1.2 above and considering the particular instructions and requirements set out in Tetra Tech's fee proposal and the Client's acceptance. It is not intended for and should not be relied on by any third party and no responsibility is undertaken to any third party.

1.3.2 Tetra Tech Ltd accepts no duty or responsibility (including in negligence) to any party other than Southern (UK) and disclaims all liability of any nature whatsoever to any such party in respect of this report.

1.3.3 This report cannot be reproduced without Tetra Tech's written consent.

2.0 SITE DESCRIPTION

2.1 SITE LOCATION

2.1.1 The site is located off Verwood Road, Verwood, Hampshire at grid reference 411636, 107725. The application boundary measures approximately 2.77 hectares (ha) in size and is shown in Figure 1 below.

Figure 1 Site location plan

2.1.2 The site is located within the centre of Ringwood Forest and is bounded to the west by the main settlement of Verwood. Ringwood town centre is located is located approximately 3.20 km to the southeast of the site. The west of the site is bounded by the B3081. The site is immediately bounded to the south by the former Somerley Landfill Site which is now restored.

2.1.3 Access to the site is located to the west of the site via the B3081 which connects to the A31.

2.2 SITE DESCRIPTION

2.2.1 The application boundary is situated within land associated with an active land fill, however, the site itself predominantly comprises former landfill cells which are now covered by temporary caps. An Existing Site Layout Plan is included as Appendix A.

2.3 TOPOGRAPHY

2.3.1 A review of site contours contained within the Existing Site Layout Plan indicates the following:

- Ground levels in the northern area of the site are shown to range between 49.00 – 50.00 m Above Ordnance Datum (m AOD);
- Ground levels in the southern area of the site are shown to range between 50.00 – 53.00 m AOD;
- The eastern site boundary is shown to be at a level of approximately 51.00 m AOD with levels to the east rising to 57.00 m AOD;
- Levels to the west of the site are shown to range between 51.00 – 53.00 m AOD.

2.3.2 In addition to the above, a review of 1 m resolution LiDAR data (Figure 2) has been undertaken to determine ground levels surrounding the site which are described as follows:

- Ground levels to the west of the site are shown to slope to a level of approximately 30.00 m AOD at the access to the site along the B3081;
- Ground levels to the east of the site are shown to rise to approximately 58.00 m AOD.

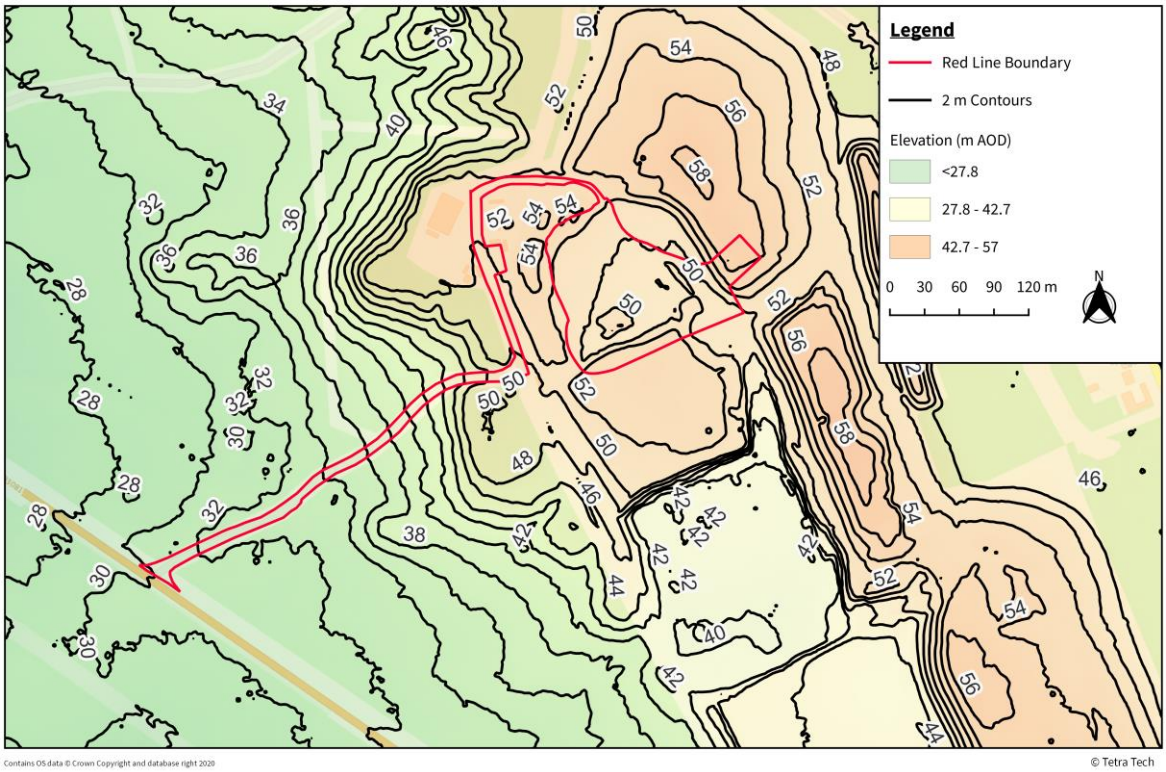


Figure 2 LiDAR elevation data

2.4 HYDROLOGICAL SETTING

2.4.1 A review of Ordnance Survey mapping indicates the following watercourses within the vicinity of the site:

- The nearest watercourses are series of drains located to the east of the Alderholt Road to the east of the site. It is anticipated that the drains generally flow in an easterly direction towards the River Avon, an EA defined Main River, which is located approximately 2.00 km east of the site;
- Ebblake Stream, which is classified as an Ordinary Watercourse, is located approximately 780 m west of the site. Ebblake Stream flows in a southerly direction before discharging into the Moors River approximately 1.60 km southwest of the site. The Moors River continues to flow south through the Moor Valley Country Park and Forest.
- There are no canals located within 1km of the site.

2.5 EXISTING DRAINAGE

On-site Drainage

2.5.1 Based on the nature of the existing site it is anticipated that there is no formal positive drainage network.

Off-site Drainage

2.5.2 A review of Wessex Water public sewer records indicates there are no public assets within the vicinity of the site.

2.6 HYDROGEOLOGY

Soils

2.6.1 A review of DEFRA's online Multi Agency Geographic Information for the Countryside (MAGIC) website indicates the site is underlain by naturally wet very acid sandy and loamy soils.

Geology

2.6.2 A review of British Geological Survey (BGS) online mapping (1:50,000 scale) indicates the site is situated within an area underlain by superficial River Terrace Deposits which are described as comprising sand and gravel, however, ground levels have been altered as a result of historic excavation for minerals and more recent landfilling activities. The site is shown to be predominantly underlain by bedrock deposits from the Parkstone Sand Member. The northern area of the site is shown to be underlain by bedrock deposits from the Branksome Sand Formation and Parkstone Clay Member.

2.6.3 A review of BGS borehole records indicates the presence of two BGS boreholes within the site, however, no borehole logs are available.

3.0 PROPOSED DEVELOPMENT

3.1.1 The existing landfill is permitted to accept non-hazardous waste with waste disposal commencing in April 2000. The landfill comprises nine cells in which landfill activities are ongoing. Some of the cells are filled, capped and restored to final levels; some are partially filled; while others are full operational and are still accepting. Proposed development plans are included as Appendix B.

3.1.2 The proposed development comprises the installation of an Incinerator Bottom Ash (IBA) pad and associated operational equipment for the maturation, processing, storage and eventual sale of IBA and associated residual materials.

3.1.3 The proposed works will be situated on top of Cells 8 and 9 which currently benefit from an installed temporary cap along with leachate and landfill gas management systems and leachate control.

3.1.4 The proposed development will exist on site until Cells 8 and 9 are subject to final restoration which is estimated to be in December 2028. At this point, the IBA facility will be decommissioned and Cells 8 and 9 filled to consented levels.

3.1.5 The site will comprise a solid Type 1 or equivalent base underlain by water-proof membrane. The development will be surrounded by a 0.5 m high bund wall overlain by a welded HDPE sheet for containment purposes. The processing area will be designed with a capacity to retain all liquid run-off based on a 100 year plus 30% storm event to ensure no potential contaminated water leaves the site. Water within the site will be drained towards a sump at the lowest point and subsequently pumped to a storage lagoon. Water within the lagoon will be used for dust suppression purposes with surplus water removed from site by tanker and disposed of at a suitable facility.

3.1.6 Ground levels within the central area of the site in which the proposed IBA pad will be located will be raised from 49.00 m AOD to 51.00 m AOD to provide a level surface.

4.0 FLOOD RISK

4.1 FLUVIAL AND TIDAL RISK

4.1.1 A floodplain is the area that would naturally be affected by flooding if a river rises above its banks or is inundated by the sea (coastal or tidal flooding). In England, floodplains are divided into flood zones for planning purposes. These show the extent of the natural floodplain area at risk of inundation if there were no flood defences or certain other manmade structures and channel improvements. They are divided as follows:

- Flood Zone 1 is land assessed as having an annual probability of flooding of less than 1 in 1000 (<0.1%).
- Flood Zone 2 is land assessed as having an annual probability of fluvial flooding of between a 1 in 1000 (0.1%) and 1 in 100 (1%) or an annual probability of tidal flooding of between 1 in 1000 (0.1%) and 1 in 200 (0.5%);
- Flood Zone 3 is land assessed as having an annual probability of fluvial flooding of greater than 1 in 100 (>1%), or an annual probability of tidal flooding of greater than 1 in 200 (>0.5%) from tidal flooding.

4.1.2 A review of the Environment Agency (EA) online Flood Map for Planning, included as Figure 3, indicates the site is entirely within Flood Zone 1.

Figure 3 EA Flood Map for Planning

4.1.3 In July 2021, the EA published updated climate change guidance for peak river flows. The EA Flood Map for Planning does not typically consider the latest climate change guidance for peak river flows. The nearest flood extent is located to the west of the site and is associated with Ebblake Stream. A review of ground elevation data indicates the site is located approximately 20 m above the nearest flood extent thus it is reasonable to consider that the site will remain in Flood Zone 1 considering the impacts of climate change.

4.1.4 Based on the above, the overall risk of fluvial flooding is considered to be low.

4.1.5 The site is located inland at a minimum elevation of 49.00 m AOD. The site is therefore considered to be at a negligible risk of tidal flooding.

4.2 SURFACE WATER & OVERLAND FLOWS

4.2.1 Surface water flooding can occur during high intensity rainfall events as sheet runoff from fields or hard paved areas. It is particularly prevalent in areas with significant hardstanding or poorly permeable soils (i.e. clay). This is because the grounds capacity for infiltration is reduced. In addition, the inability to enter local drainage systems also contributes to risk from this source. The risk of surface water flooding is divided as follows, as defined by the Environment Agency:

- Very low risk means that the annual probability of flooding is less than 1 in 1000 (<0.1%).
- Low risk means that the annual probability of flooding is between 1 in 1000 (0.1%) and 1 in 100 (1%).
- Medium risk means that the annual probability of flooding is between 1 in 100 (1%) and 1 in 30 (3.3%).
- High risk means that the annual probability of flooding of greater than 1 in 30 (>3.3%).

4.2.2 A review of the EA Long Term surface water flood map (included as Figure 4) indicates the site is predominantly at a very low risk of surface water flooding. Notwithstanding. an area of high risk surface water flooding is indicated in the central, western area of the site. Surface water flooding appears to be as result of ponding within a small topographic depression.

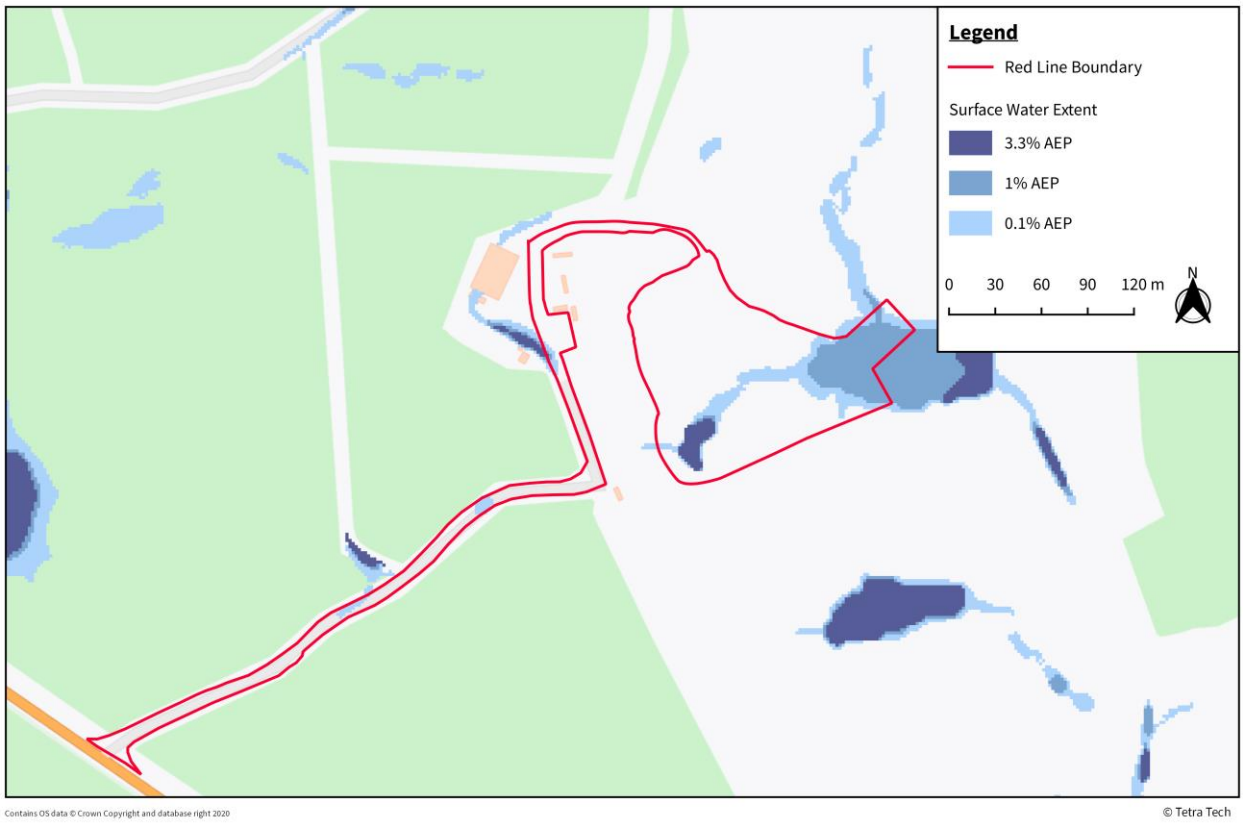


Figure 4 EA Long Term Surface Water Flood Map

4.2.3 A linear area of low risk flooding is shown to extend from the aforementioned high risk area, indicating the formation of a surface water overland flow path during the low risk event. Water is shown to flow towards the eastern boundary of the site where an area of low to medium risk of surface water flooding. This area indicates the ponding of water within a low spot within the wider landfill site.

4.2.4 The proposed development comprises the installation of a temporary IBA facility. The development will be surrounded by a 0.5 m high bund wall overlain by a welded HDPE sheet for containment purposes. The processing area will be designed with a capacity to retain all liquid run-off based on a 100 year plus 30% storm event to ensure no potential contaminated water leaves the site. Water within the site will be drained towards a sump at the lowest point and subsequently pumped to a storage lagoon. Water within the lagoon will be used for dust suppression purposes with surplus water removed from site by tanker and disposed of at a suitable facility.

4.2.5 Surface water runoff within the IBA work area will be collected within a 100 m^2 sump. Water will then be pumped to a surface water lagoon that will provide capacity to accommodate runoff up to a 1 in 30 year storm event. During 1 in 100 year plus climate change event, the IBA work area will be flooded and on site operations suspended until water is removed by tanker for offsite treatment.

4.2.6 The use of pumps for the management of surface water runoff represents a potential source of flooding in the event of pump failure. It is recommended that the pumping station is subject to a regular programme of monitoring and maintenance to reduce the potential for pump failure to occur.

4.2.7 Based on the above, the overall risk of surface water flooding is considered to be low.

4.3 GROUNDWATER FLOODING

4.3.1 Groundwater flooding occurs when groundwater emerges at the surface under conditions where the 'normal' range of groundwater levels and groundwater flows is exceeded.

4.3.2 Based on the nature of the underlying geology, it is anticipated that the risk of groundwater flooding is low. Moreover, the proposed development will comprise a solid Type 1 or equivalent base underlain by water-proof membrane which is likely to reduce the potential for the vertical migration of groundwater.

4.4 SEWER FLOODING

4.4.1 Sewer flooding occurs when intense rainfall overloads the sewer system capacity and/or when sewers cannot discharge properly to watercourses due to high water levels. Sewer flooding can also be caused when problems such as blockages, collapses or equipment failure occur in the sewerage system.

4.4.2 Based on the nature of the existing site, it is anticipated that there is no formal positive drainage network. A review of Wessex Water public sewer records indicates there are no public assets within the vicinity of the site.

4.4.3 Based on the above, the overall risk of sewer flooding is considered to be low.

4.5 RESERVOIR FLOODING

4.5.1 Flooding from reservoirs occurs when a reservoir dam is overtopped or breaches due to structural failure. The consequence of such an event would be severe but the probability of a catastrophic dam failure is considered to be extremely low due to the management and maintenance required under the Reservoirs Act 1975.

4.5.2 A review of the EA Long Term Reservoir Flood Map indicates the site is located within an area that is not at risk of reservoir flooding.

4.5.3 Based on the above, the overall risk of reservoir flooding is considered to be negligible.

4.6 CANAL FLOODING

4.6.1 A review of Ordnance Survey mapping indicates there are no canals within the immediate vicinity of the site therefore the risk of canal flooding is considered to be negligible.

5.0 DEVELOPMENT PROPOSALS

5.1 PLANNNG POLICY & GUIDANCE

National Planning Policy Framework

5.1.1 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these should be applied with a presumption in favour of sustainable development. Chapter 14 'Meeting the challenge of climate change, flooding and coastal change' sets out the Government's policies in relation to flood risk and drainage. The NPPF aims to guide development away from areas at the highest risk of flooding during the present day and future climate change scenarios. Where development is necessary in high-risk areas, the NPPF requires development to be made safe for its lifetime without increasing flood risk elsewhere. The NPPF is supported by relevant technical guidance which provides advice on how to take account of and address the risk associated with flooding in the planning process.

Sequential Test

5.1.2 The aim of the Sequential Test is to steer new development to areas with the lowest risk of flooding from any source. Development should not be allocated or permitted if there are reasonably available sites for the proposed development in areas with a lower risk of flooding.

Exception Test

5.1.3 Where it is not possible for development to be located in areas with a lower risk of flooding, the Exception Test may need to be applied. To pass the Exception Test, it should be demonstrated that:

a) The development would provide wider sustainability benefits to the community that outweigh flood risk; and

b) The development will be safe for its lifetime taking account of the vulnerability of its users, without increase flood risk elsewhere, and, where possible, will reduce flood risk overall.

Local Policies

5.1.4 The site is located within the administrative boundary of New Forest District Council (NFDC). The NFDC Local Plan 2016-2036 was adopted by the Council on 6th July 2020. Policy CCC1 'Safe and healthy communities' contained within the Local Plan identifies that vulnerable developments will not be permitted "in areas at risk of flooding unless in accordance with the sequential and exception tests".

5.2 DEVELOPMENT AND FLOOD RISK

Flood Risk to the Development

5.2.1 As assessed in Section 4, the site is considered to be at a negligible to low risk of flooding from the proposed development.

5.2.2 For containment purposes, the proposed development will be surrounded by a 0.5 m high bund that will retain surface water runoff on site. The processing area will be designed with a capacity to retain all liquid runoff to ensure no contaminated water leaves the site. Water within the site will be drained towards a sump at the lowest point and subsequently pumped to a storage lagoon.

5.2.3 Surface water runoff within the IBA work area will be collected within a 10 m x 10 m sump. Water will then be pumped to a surface water lagoon that will provide capacity to accommodate runoff up to a 1 in 30 year storm event. During 1 in 100 year plus climate change event, the IBA work area will be flooded and on site operations suspended until water is removed by tanker for offsite treatment.

5.2.4 The use of pumps for the management of surface water runoff represents a potential source of flooding in the event of pump failure. It is recommended that the pumping station is subject to a regular programme of monitoring and maintenance to reduce the potential for pump failure to occur.

5.2.5 It is recommended that a Flood Management Plan (FMP) is prepared. The FMP should aim to set out the procedures and protocol that should be followed in the event that operations are suspended as a result of temporary surface water flooding of the site.

5.2.6 The proposed development will exist on site until Cells 8 and 9 of the wider landfill are subject to final restoration which is estimated to be in December 2028. At this point, the IBA facility will be decommissioned and Cells 8 and 9 filled to consented levels.

Flood Risk Arising from the Development

5.2.7 The proposed development is wholly located within Flood Zone 1 and will not result in the displacement of flood water and as such there is not requirement to provide floodplain compensation.

5.2.8 As noted above, surface water runoff generated within the proposed development will be wholly contained on site and will be removed as required by tanker. There will no off site discharge from the proposed development to ensure there is no release of potentially contaminated water.

5.2.9 The proposed development will be temporary in nature and is expected decommissioned on completion of restoration of Cells 8 and 9 of the wider landfill which is expected to be completed in December 2028. As such, any potential impacts arising from the proposed development will be of a short duration and will be removed on decommissioning of the site.

Sequential and Exception Test

5.2.10 The site is considered to be at a negligible to low risk of flooding from flooding and is therefore considered to meet the requirements of the Sequential Test. Application of the Exception Test is not considered to be required.

6.0 SURFACE WATER MANAGEMENT

6.1 INTRODUCTION

6.1.1 The application boundary measures an area of approximately 2.6 ha and comprises Cells 8 and 9 of the wider Blue Haze landfill and associated access road. The access road will be retained as existing therefore, for the purposes of this assessment, the main area of the site, which measures approximately 2.0 ha has been considered.

6.1.2 The proposed development comprises the installation of an Incinerator Bottom Ash (IBA) pad and associated operational equipment for the maturation, processing, storage, and eventual sale of IBA and associated residual materials.

6.1.3 The proposed works will be situated on top of Cells 8 and 9 which currently benefit from an installed temporary cap along with leachate and landfill gas management systems and leachate control.

6.1.4 The proposed development will exist on site until Cells 8 and 9 are subject to final restoration which is estimated to be in December 2028. At this point, the IBA facility will be decommissioned and Cells 8 and 9 filled to consented levels.

6.1.5 The site will comprise a solid Type 1 or equivalent base underlain by water-proof membrane. The development will be surrounded by a 0.5 m high bund wall overlain by a welded HDPE sheet for containment purposes. The processing area will be designed with a capacity to retain all liquid run-off based on a 100 year plus 30% storm event to ensure no potential contaminated water leaves the site. Water within the site will be drained towards a sump at the lowest point and subsequently pumped to a storage lagoon. Water within the lagoon will be used for dust suppression purposes with surplus water removed from site by tanker and disposed of at a suitable facility.

6.2 PEAK FLOW RATES

6.2.1 Peak flow rates have been calculated using the Interim Code of Practice for Sustainable Drainage Systems (ICP SuDS) method based the main area of the site which measures 2.00 ha in size. For the purposes of this assessment, the soil index within the ICP SuDS calculations has been set at a value of 0.5 which is considered representative of the proposed Type 1 or equivalent base and underlying waterproof membrane. There will be no infiltration of water into the ground via the proposed surfacing. ICP SuDS calculations are included as Appendix C and summarised in Table 1 below.

Table 1 Peak flow rates

Return Period	Peak Flow Rate (l/s)
1 in 1	11.8
QBAR	13.9

Return Period	Peak Flow Rate (l/s)
1 in 30	31.4
1 in 100	44.2

6.3 SURFACE WATER VOLUMES

6.3.1 The anticipated volume of surface water has been estimated using Micro Drainage software based on the main site area of approximately 2.0 ha which will be wholly surrounded by the proposed containment bund. The existing access road will be retained as existing. The main site area will be surfaced with a Type 1 or equivalent base underlain by a water-proof membrane. For the purposes of this assessment, the proposed Type 1 or equivalent base has been considered as an impermeable area. There will be no surface water discharge from the proposed development.

6.3.2 During the 1 in 30 year rainfall event, Micro Drainage Quick Storage Estimates (QSE) (included as Appendix D) indicate that approximately 2,103 m^3 of storage would be required to contain all surface water runoff on site.

6.3.3 During the 1 in 100 year plus 30% climate change scenario, Micro Drainage QSE calculations indicate a required storage volume of 3,097 m^3.

6.4 SURFACE WATER MANAGEMENT

6.4.1 Surface water runoff generated within the IBA work area will be conveyed to a 10 m x 10 m sump from which water will be pumped to a storage lagoon. The storage lagoon will be sized to provide storage capacity for the 1 in 30 year storm event which has been estimated as 2,103 m^3.

6.4.2 It is proposed to provide attenuation within a storage lagoon measuring 1,320 m^2. Based on assumed side slopes at a gradient of 1 in 2 and an overall depth of 2 m, Micro Drainage source control calculations, included as Appendix E, indicate the storage lagoon will provide an overall storage volume of 2,158 m^3. The proposed storage lagoon will be located in the south eastern corner of the site, as shown in the proposed site layout plans included at Appendix B. It should be noted that relevant health and safety measures (including but not limited to fencing and appropriate signage) will be required based on the proposed storage lagoon. Surface water contained within the storage lagoon will be used for dust suppression purposes. Surplus water will be tankered off site and disposed of at a suitable facility.

6.4.3 For the purposes of this assessment, an assessment of a range of potential pump flow rates has been undertaken up to the 1 in 30 year peak flow rate and is summarised in Table 2 below:

Table 2 Pump Flow rates

Pump Flow Rate (l/s)	Flooded Volume (m^3)
5	225.000
10	220.000
15	214.600
20	209.570
25	204.500
30	199.481

6.4.4 Based on the above, minor flooding of the pumping station may occur, however, flooding would likely be relatively contained and shallow. It may be possible to reduce the flooded volume by increasing the pump rate beyond 30 l/s and by introducing additional measures to mitigate flooding, however, such measures may not be commensurate to the temporary nature of the proposed development. Further consideration of the proposed pump flow rate will be required at the detailed design stage. The final pump flow rate should be confirmed in consultation with an appropriate pump supplier/manufacturer. It should be noted that an appropriate mechanism will be required to ensure that the pump shuts off once the storage lagoon has reached maximum capacity.

6.4.5 During the 1 in 100 year plus 30% climate change scenario, the IBA work area will be flooded and on site operations suspended. As noted in Section 6.3, Micro Drainage QSE calculations indicate a storage volume of 3,097 m^3 during the 1 in 100 year plus 30% climate change scenario which represents an increase of 994 m^3 over the 1 in 30 year storage volume. It is proposed that this additional volume will flood the IBA work and be contained on site prior to removal by tanker and disposal at a suitable facility. Flooding of the IBA work area during the 1 in 100 year plus 30% climate change event will result in an average depth of flooding of approximately 0.05 m across the IBA work area based on an overall size of 2.00 ha.

7.0 SUMMARY AND CONCLUSION

7.1 CONCLUSION

7.1.1 The proposed development comprises the installation of an Incinerator Bottom Ash (IBA) pad and associated operational equipment. The proposed development will be temporary and is expected to be decommissioned following completion of landfill restoration to permitted finished levels within Cells 8 and 9 which is expected in December 2028.

7.1.2 According to the EA online Flood Map for Planning, the site is considered to be wholly located within Flood Zone 1. The site is also considered to be at a negligible to low risk of flooding from all other sources.

7.1.3 The site will comprise a solid Type 1 or equivalent base underlain by water-proof membrane. The development will be surrounded by a 0.5 m high bund wall overlain by a welded HDPE sheet for containment purposes. There will be no discharge of surface water runoff from the proposed development. Runoff generated within the site will be conveyed to a 10 m x 10 m sump from which water will be pumped to a storage lagoon. The storage lagoon has been sized to accommodate surface water runoff for the 1 in 30 year storm event. Water within the storage lagoon will be used for dust suppression purposes with surplus water removed from site by tanker and disposed of at a suitable facility.

7.1.4 During the 1 in 100 year plus 30% climate change scenario, the additional volume of surface water runoff will flood the IBA work area with operation temporarily suspended. Water will be removed from site by tanker and disposed of at a suitable facility. The site will be impacted by flooding to an average depth of 0.05 m based on the overall size of the IBA work area which measures approximately 2.00 ha.

7.2 RECOMMENDATIONS

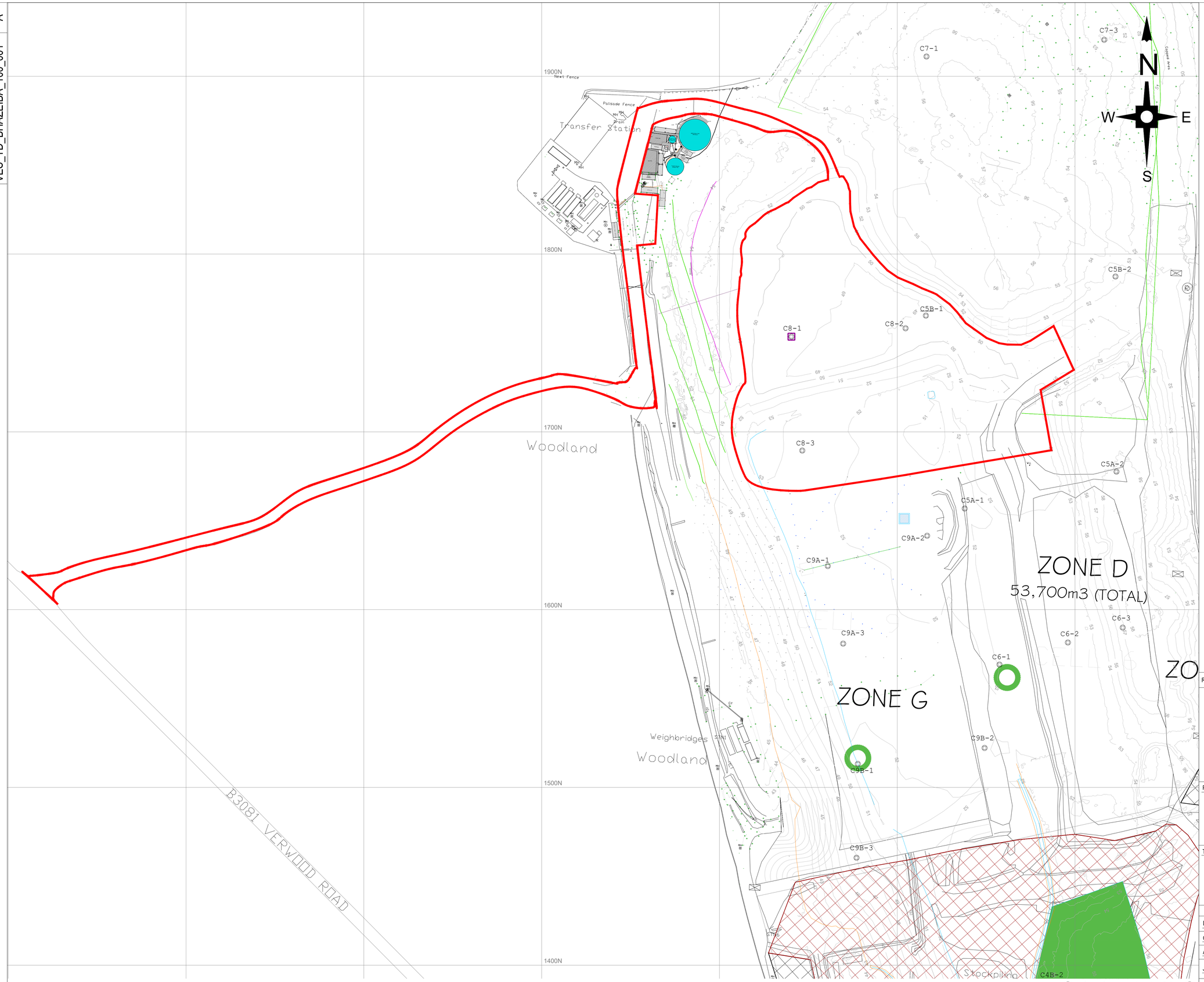
7.2.1 The following is recommended:

- Prepare a Flood Management Plan to outline the procedures and protocol that should be followed in the event that operations are suspended as a result of surface water flooding;
- Confirm the final pumping rate at the detailed design stage in consultation with an appropriate pump supplier/manufacturer;
- An appropriate mechanism will be required to ensure that the pump shuts off once the storage lagoon has reached maximum capacity; and
- Install and maintain the proposed pump in accordance with manufacturer instructions.

APPENDIX A: EXISTING SITE LAYOUT

Revision A

Drawing No. VES_TD_BHAZEIBA_100_001



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KEY

DEVELOPMENT BOUNDARY

Rev	Description of revision	Drawn	Chkd	App	Date

VEOLIA

Technical Direction,
8th Floor, 210 Pentonville Road, London. N1 9JY
Tel: 0207 812 5189

Project

BLUE HAZE LANDFILL
IBA PROJECT BH24 3QE

Title

EXISTING SITE LAYOUT

	Initials	Date	Scale	Sheet size
Drawn	RB	27.09.23	1:1000 @ A1	A1
Checked				
Approved				

Job No. BHAZE

Drawing No. VES_TD_BHAZEIBA_100_001

Revision A

FOR PLANNING

APPENDIX B: PROPOSED DEVELOPMENT PLANS

Revision C

Drawing No. VES_TD_BHAZEIBA_100_002

1900N

Newt Fence

Palisade Fence

Drain

Transfer Station

MH

CAR PARKING (EXISTING)

OFFICE / WELFARE

Office-Welfare

IBA PLANT

PROPOSED SUMP

PROPOSED 40m X 33m LAGOON

1800N

9,000 ton. Processed Ash

38000

54000

WORKSHOP

Workshop

IBA 10000 ton

1700N

Woodland

W.L

1:500

0 10 20 50 100

FOR PLANNING

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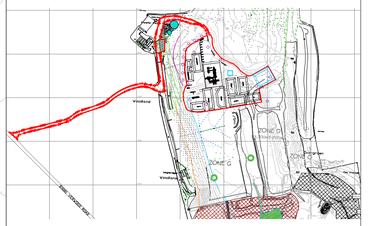
KEY

DEVELOPMENT BOUNDARY

SITE LOCATION PLAN



Rev	Description of revision	Drawn	Chkd	App	Date
C	LAGOON & BOUNDARY UPDATED	RB			07.02.24
B	BOUNDARY UPDATED	RB			15.01.24

VEOLIA

Technical Direction,
8th Floor, 210 Pentonville Road, London. N1 9JY
Tel: 0207 812 5189

Project

BLUE HAZE LANDFILL
IBA PROJECT BH24 3QE

Title

PROPOSED SITE LAYOUT

	Initials	Date	Scale	Sheet size
Drawn	RB	27.09.23	1:500 @ A1	A1
Checked				
Approved				

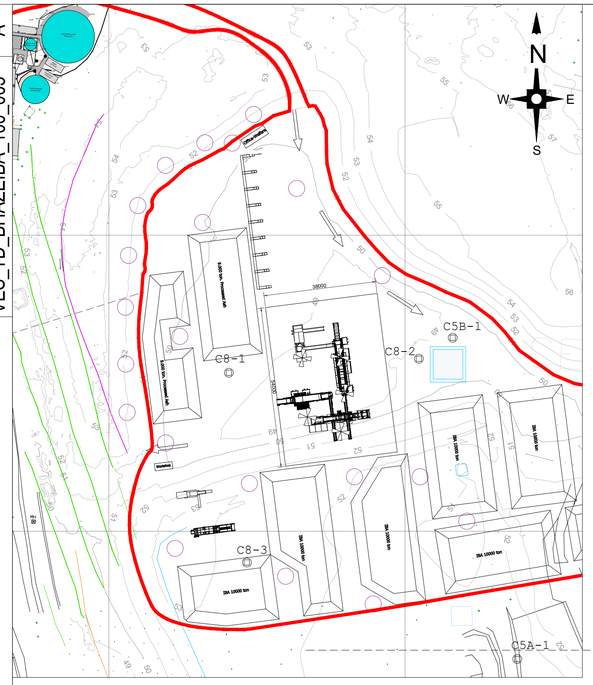
Job No. BHAZE

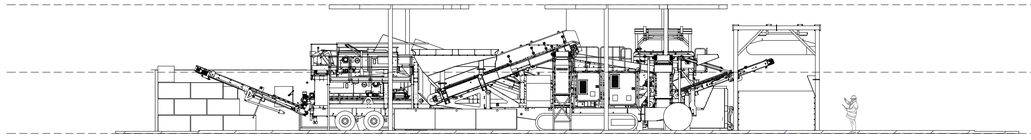
Drawing No. VES_TD_BHAZEIBA_100_002

Revision C

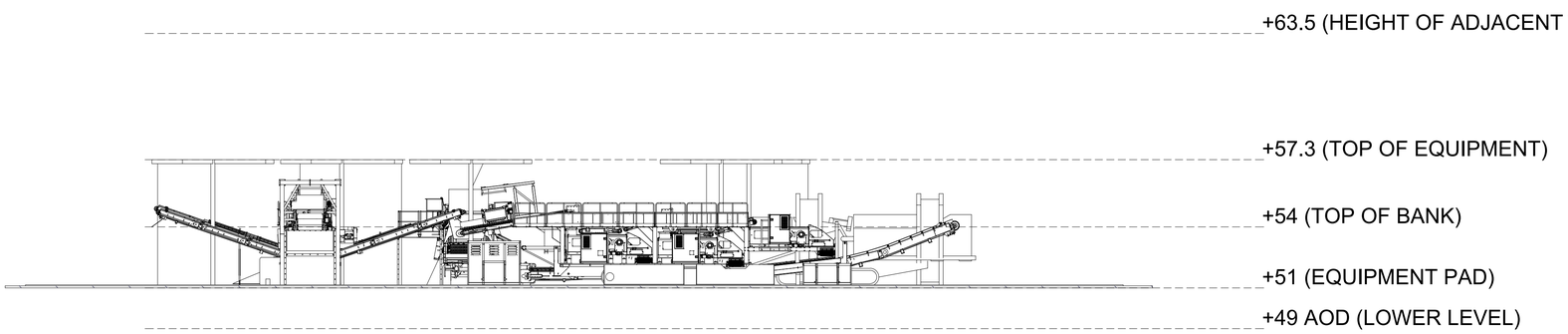
Revision A

Drawing No. VES_TD_BHAZEIBA_100_005





A-A



B-B

FOR PLANNING

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KEY

DEVELOPMENT BOUNDARY

Rev	Description of revision	Drawn	Chkd	App	Date

VEOLIA

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Project

BLUE HAZE LANDFILL
IBA PROJECT BH24 3QE

Title

PROPOSED SITE
SECTION DRAWINGS

	Initials	Date	Scale	Sheet size
Drawn	RB	04.01.24	1:150 @ A1	A1
Checked				
Approved				

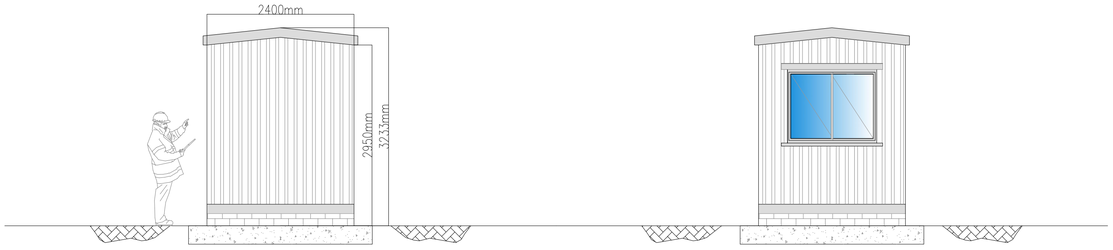
Job No. BHAZE

Drawing No. VES_TD_BHAZEIBA_100_005

Revision A

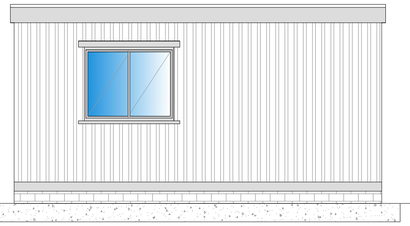
Revision A

Drawing No. VES_TD_BHAZEIBA_100_007

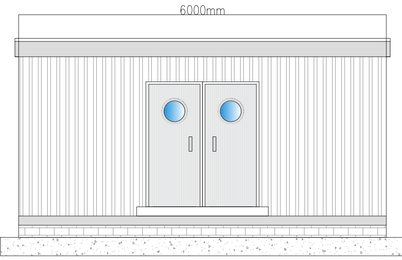


WEST ELEVATION

EAST ELEVATION



SOUTH ELEVATION



NORTH ELEVATION

1:50
0 1 2 3 4 5 10

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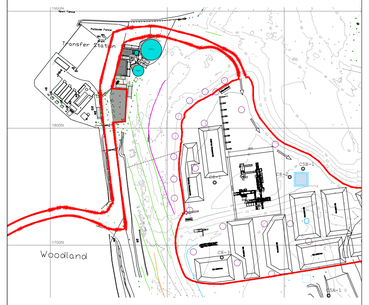
KEY

DEVELOPMENT BOUNDARY

SITE LOCATION PLAN



Rev	Description of revision	Drawn	Chkd	App	Date

VEOLIA

Technical Direction,
8th Floor, 210 Pentonville Road, London. N1 9JY
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Project

BLUE HAZE LANDFILL
IBA PROJECT BH24 3QE

Title

PROPOSED WORKSHOP ELEVATIONS

	Initials	Date	Scale	Sheet size
Drawn	RB	11.01.24	1:50 @ A1	A1
Checked				
Approved				

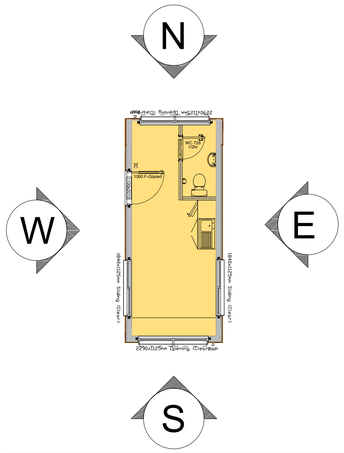
Job No. BHAZE

Drawing No. VES_TD_BHAZEIBA_100_007

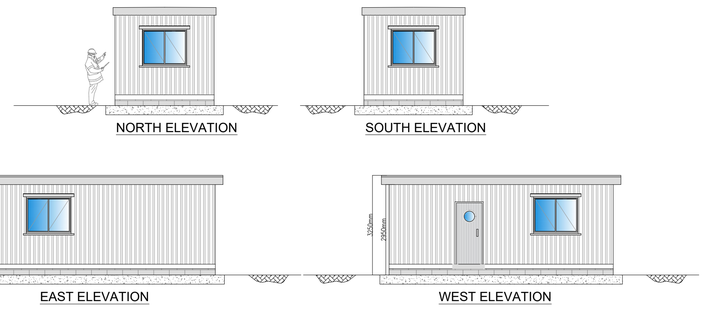
Revision A

Revision B

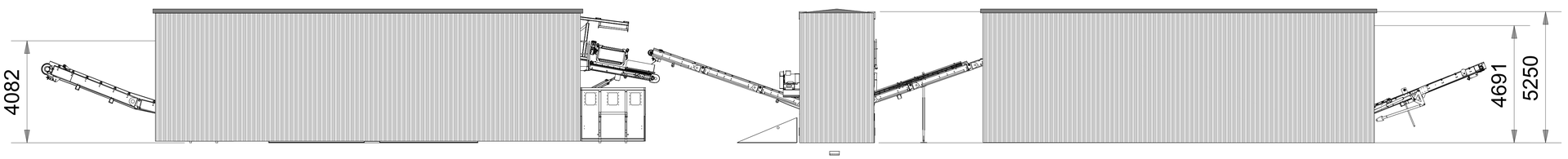
Drawing No. VES_TD_BHAZEIBA_100_004



GROUND FLOOR PLAN



OFFICE/WELFARE ELEVATIONS



MAIN PROCESSING EQUIPMENT AREA

1:100

0 5 10 15 20

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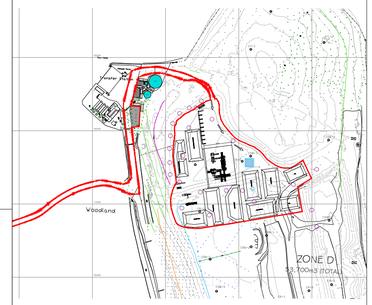
KEY

DEVELOPMENT BOUNDARY

SITE LOCATION PLAN



Rev	Description of revision	Drawn	Chkd	App	Date

VEOLIA

Technical Direction,
8th Floor, 210 Pentonville Road, London. N1 9JY
Tel: 0207 812 5189

Project

BLUE HAZE LANDFILL
IBA PROJECT BH24 3QE

Title

PROPOSED EQUIPMENT ELEVATIONS

	Initials	Date	Scale	Sheet size
Drawn	RB	06.11.23	1:100 @ A1	A1
Checked				
Approved				

Job No. BHAZE

Drawing No. VES_TD_BHAZEIBA_100_004

Revision B

APPENDIX C: RUNOFF RATES

ICP SUDS Mean Annual Flood

Input

Return Period (years) 30 SAAR (mm) 850 Urban 0.000
Area (ha) 2.000 Soil 0.500 Region Number Region 7

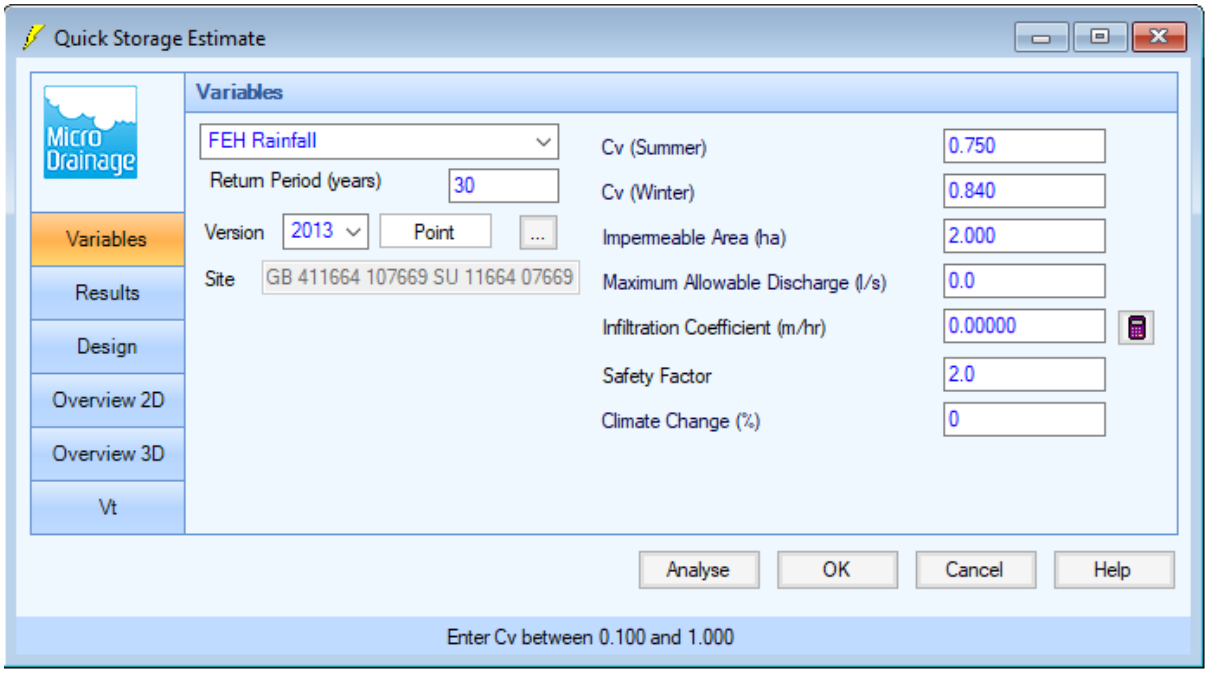
Results l/s

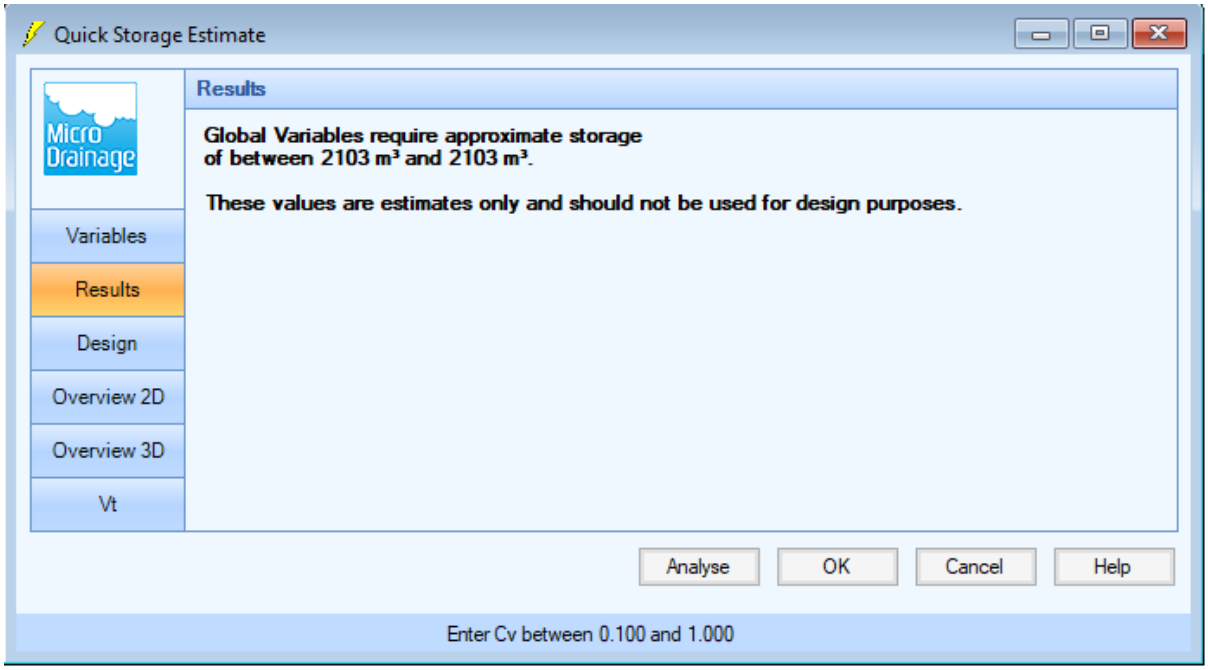
QBAR Rural 13.9
QBAR Urban 13.9

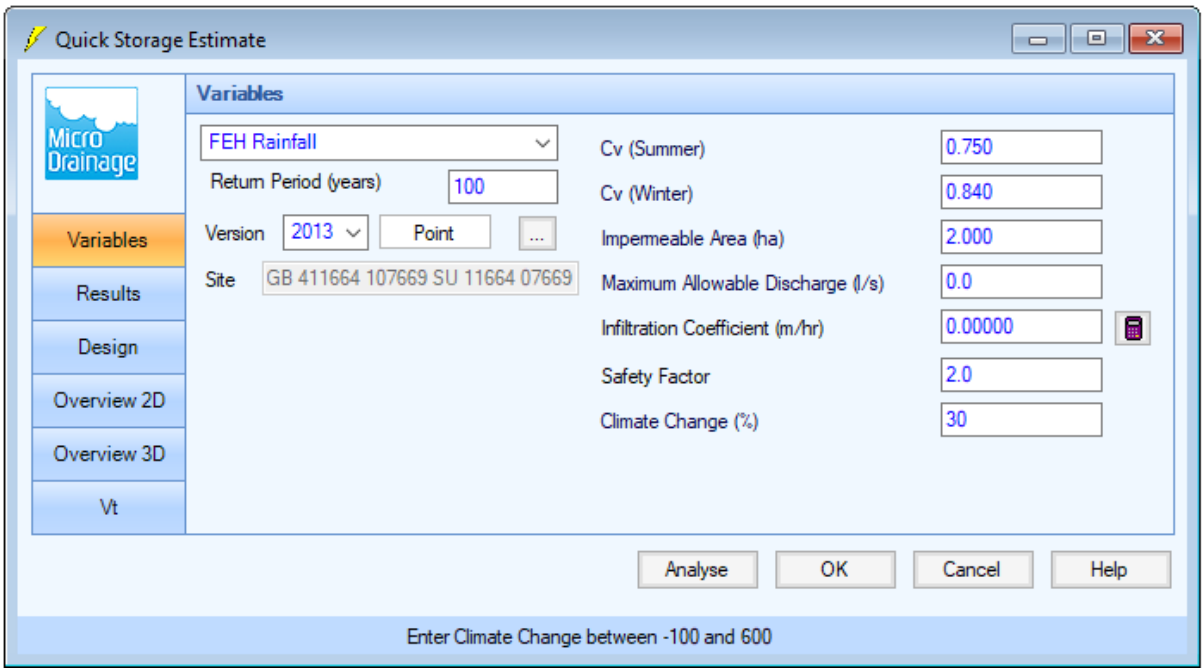
Q30 years 31.4

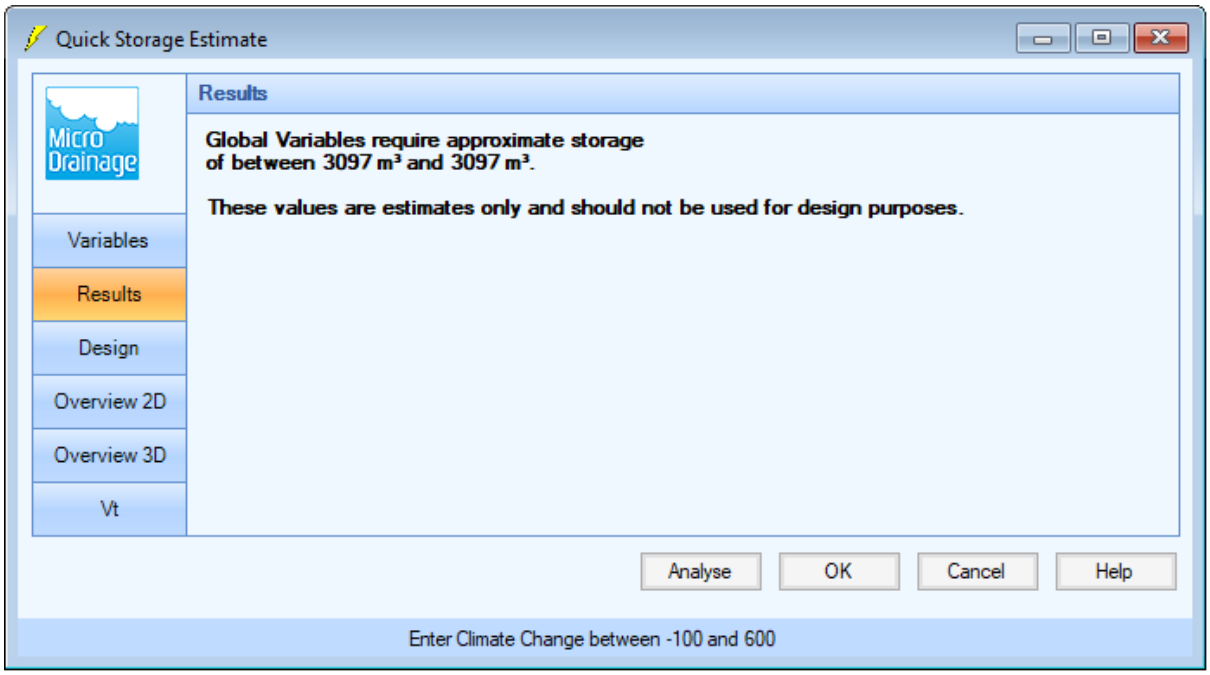
Q1 year 11.8
Q30 years 31.4
Q100 years 44.2

APPENDIX D: MICRO DRAINAGE QUICK STORAGE ESTIMATES


Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Variables
FEH Rainfall
Return Period (years)
30
Version
2013
Point
...
Site
GB 411664 107669 SU 11664 07669
Cv (Summer)
0.750
Cv (Winter)
0.840
Impermeable Area (ha)
2.000
Maximum Allowable Discharge (l/s)
0.0
Infiltration Coefficient (m/hr)
0.00000
Safety Factor
2.0
Climate Change (%)
0
Analyse
OK
Cancel
Help
Enter Cv between 0.100 and 1.000


Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Results
Global Variables require approximate storage
of between 2103 m³ and 2103 m³.
These values are estimates only and should not be used for design purposes.
Analyse
OK
Cancel
Help
Enter Cv between 0.100 and 1.000


Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Variables
FEH Rainfall
Return Period (years)
100
Version
2013
Point
...
Site
GB 411664 107669 SU 11664 07669
Cv (Summer)
0.750
Cv (Winter)
0.840
Impermeable Area (ha)
2.000
Maximum Allowable Discharge (l/s)
0.0
Infiltration Coefficient (m/hr)
0.00000
Safety Factor
2.0
Climate Change (%)
30
Analyse
OK
Cancel
Help
Enter Climate Change between -100 and 600


Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Results
Global Variables require approximate storage
of between 3097 m³ and 3097 m³.
These values are estimates only and should not be used for design purposes.
Analyse
OK
Cancel
Help
Enter Climate Change between -100 and 600

APPENDIX E: MICRO DRAINAGE SOURCE CONTROL CALCULATIONS

Summary of Results for 30 year Return Period

Outflow is too low. Design is unsatisfactory.

Storm Event	Max Level (m)	Max Depth (m)	Max Volume (m³)	Status
15 min Summer	98.316	0.316	281.0	O K
30 min Summer	98.416	0.416	374.1	O K
60 min Summer	98.526	0.526	478.5	O K
120 min Summer	98.648	0.648	598.7	O K
180 min Summer	98.724	0.724	674.8	O K
240 min Summer	98.778	0.778	729.9	O K
360 min Summer	98.852	0.852	806.6	O K
480 min Summer	98.904	0.904	860.7	O K
600 min Summer	98.944	0.944	902.9	O K
720 min Summer	98.976	0.976	937.6	O K
960 min Summer	99.028	1.028	993.2	O K
1440 min Summer	99.106	1.106	1077.9	O K
2160 min Summer	99.192	1.192	1173.4	O K
2880 min Summer	99.262	1.262	1252.9	O K
4320 min Summer	99.384	1.384	1392.9	O K
5760 min Summer	99.491	1.491	1519.2	O K
7200 min Summer	99.592	1.592	1641.2	Flood Risk
8640 min Summer	99.689	1.689	1760.1	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.924	0.0	27
30 min Summer	49.883	0.0	42
60 min Summer	31.902	0.0	72
120 min Summer	19.958	0.0	132
180 min Summer	14.995	0.0	192
240 min Summer	12.165	0.0	252
360 min Summer	8.963	0.0	372
480 min Summer	7.173	0.0	492
600 min Summer	6.019	0.0	612
720 min Summer	5.209	0.0	732
960 min Summer	4.138	0.0	972
1440 min Summer	2.994	0.0	1452
2160 min Summer	2.173	0.0	2172
2880 min Summer	1.740	0.0	2892
4320 min Summer	1.290	0.0	4332
5760 min Summer	1.055	0.0	5776
7200 min Summer	0.912	0.0	7216
8640 min Summer	0.815	0.0	8656

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Volume (m³)	Status
10080 min Summer	99.783	1.783	1877.6	Flood Risk
15 min Winter	98.353	0.353	314.7	O K
30 min Winter	98.464	0.464	419.0	O K
60 min Winter	98.584	0.584	536.0	O K
120 min Winter	98.720	0.720	670.6	O K
180 min Winter	98.803	0.803	755.7	O K
240 min Winter	98.863	0.863	817.5	O K
360 min Winter	98.944	0.944	903.4	O K
480 min Winter	99.001	1.001	964.0	O K
600 min Winter	99.045	1.045	1011.2	O K
720 min Winter	99.080	1.080	1050.1	O K
960 min Winter	99.137	1.137	1112.4	O K
1440 min Winter	99.222	1.222	1207.3	O K
2160 min Winter	99.316	1.316	1314.3	O K
2880 min Winter	99.393	1.393	1403.2	O K
4320 min Winter	99.525	1.525	1560.0	Flood Risk
5760 min Winter	99.642	1.642	1701.5	Flood Risk
7200 min Winter	99.752	1.752	1838.2	Flood Risk
8640 min Winter	99.856	1.856	1971.4	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Summer	0.745	0.0	10096
15 min Winter	74.924	0.0	27
30 min Winter	49.883	0.0	42
60 min Winter	31.902	0.0	72
120 min Winter	19.958	0.0	132
180 min Winter	14.995	0.0	192
240 min Winter	12.165	0.0	252
360 min Winter	8.963	0.0	372
480 min Winter	7.173	0.0	492
600 min Winter	6.019	0.0	612
720 min Winter	5.209	0.0	732
960 min Winter	4.138	0.0	972
1440 min Winter	2.994	0.0	1452
2160 min Winter	2.173	0.0	2172
2880 min Winter	1.740	0.0	2892
4320 min Winter	1.290	0.0	4332
5760 min Winter	1.055	0.0	5776
7200 min Winter	0.912	0.0	7216
8640 min Winter	0.815	0.0	8656

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Volume (m³)	Status
10080 min Winter	99.958	1.958	2102.9	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Winter	0.745	0.0	10096

Model Details

Storage is Online Cover Level (m) 100.000

Tank or Pond Structure

Invert Level (m) 98.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	855.0	2.000	1319.9	2.010	0.0