PLUVIAM ENVIRONMENTAL

Flood Risk Assessment

West London Composting
Uxbridge

PEL-PN0049-FRA
08.02.23

Project No: PN0049 Date: February 2022

Revision	Purpose	Date
1.0	First Issue – Draft.	15.11.22
1.1	Updated with enVar Drainage Statement.	15.12.22
1.2	Updated appendix.	20.12.22
1.3	Updated site area to suit.	08.02.23

Prepared By:

Rod Green MSc, BSc(Hons), IENG, FCIPHE, MSoPHE
Director

Checked By:

John Roberts CSSW
Director

CONTENTS

Appendices

SUMMARY

Site Location	West London Composting Ltd, Uxbridge Middlesex UB9 6LX OS: TQ 07056 88375
Proposed Development	Composting area expansion
Vulnerability Classification	Less Vulnerable
Climate Change	Allow 40% increase in rainfall intensity
Flood Zone	Flood Zone 1
Tidal Flooding	**Low and acceptable risk**
Fluvial Flooding	**Low and acceptable risk**
Pluvial Flooding	**Low and acceptable risk**
Groundwater Flooding	**Low and acceptable risk**
Sewer Flooding	**Low and acceptable risk**
Reservoirs, Canal & Artificial Sources	**Low and acceptable risk**
Flooding from the Development	**Low and acceptable risk**
Ground Conditions	Clayey soils
Surface Water Drainage Proposals	Provision of an appropriate SuDS with a 40% allowance for climate change on the 1in100 year event.
Flood Risk Vulnerability and Flood Zone Compatibility	Site is within Flood Zone 1 therefore **the development is identified as acceptable.**
Sequential & Exception Test	N/A
Additional Mitigation Measures	N/A
Conclusions & Recommendations	The conclusion of the report is **that the scheme should be approved with appropriate conditions** to be addressed as part of a detailed design.

1. INTRODUCTION

West London Composting Limited has appointed Pluviam Environmental Ltd to provide a Flood Risk Assessment (FRA) for the proposed composting expansion at the West London Composting site.

The proposed development consists an extension to the compost maturation yard, adjacent and to the north and east of the existing facility.

1.1 Flood Risk Aims

The key aims of this flood risk assessment are to:

- Assess the flood risk to the development and to demonstrate the feasibility of designing the development so that the risk of flooding is acceptable.
- Assess the potential impact of the development on flood risk elsewhere and demonstrate that this can be mitigated by using sustainable drainage systems to drain the site.
- Satisfy the requirements of the National Planning Policy.

This assessment has been carried out in accordance with the National Planning Policy Framework (NPPF). The aim of the NPPF is to ensure that flood risk is taken into account at all stages in the planning process and to direct development run-off away from the areas at highest risk. Where new development is necessary in such areas, policy aims to make it safe without increasing flood risk elsewhere and where possible to reduce flood risk overall.

Further regional and local planning policies which apply to this area include:

- West London Strategy Flood Risk Assessment (SFRA) (accessed by web: Nov 2022).
- Hillingdon Surface Water Management Plan Part 1 & 2, Jan 2014.
- Sustainable Design and Construction - Supplementary Planning Guidance, April 2014.

These documents have been referred to and their guidance incorporated into the development proposals where appropriate.

1.2 Sources of Flooding

The NPPF requires an assessment of flood risk to consider all forms of flooding and lists six forms of flooding that should be considered as part of a flood risk assessment. These forms of flooding are listed below, along with an explanation of each form of flooding.

1.2.1 Flooding From Rivers (Fluvial Flooding)

Watercourses flood when the amount of water in them exceeds the flow capacity of the river channel. Flooding can either develop gradually or rapidly, depending on the characteristics of the catchment. Land use, topography and the development can have a strong influence on flooding from rivers.

1.2.2 Flooding From the Sea (Tidal Flooding)

Flooding to low-lying land from the sea and tidal estuaries is caused by storm surges and high tides. Where tidal defences exist, they can be overtopped or breached during a severe storm, which may be more likely with climate change.

1.2.3 Flooding from Land (Pluvial Flooding)

Intense rainfall, often of short duration, which is unable to soak into the ground or enter drainage systems can run quickly off land and result in local flooding. In developed areas, this flood water can be polluted with domestic sewage where foul sewers surcharge and overflow. Local topography and built form can have a strong influence on the direction and depth of flow. The design of development down to a micro-level can influence or exacerbate this. Overland flow paths should be taken into account in spatial planning for urban developments. Flooding can be exacerbated if development increases the percentage of impervious area.

1.2.4 Flooding from Groundwater

Groundwater flooding can occur from three main sources:

- raised water tables;
- seepage; and
- percolation and groundwater recovery or rebound.

Groundwater flooding occurs when groundwater levels rise above surface levels. Groundwater flooding is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). Chalk is the most extensive source of groundwater flooding.

1.2.5 Flooding from Sewers and Drains

In urban areas, rainwater is frequently drained into sewers. Flooding can occur when sewers are overwhelmed by heavy rainfall or become blocked. Sewer flooding continues until the water drains away.

1.2.6 Flooding from Other Artificial Sources

Non-natural or artificial sources of flooding can include reservoirs, canals and lakes. Reservoir or canal flooding may occur as a result of the facility being overwhelmed and/or as a result of dam or bank failure.

1.3 Flood Zones & Classification

For river and tidal flooding, the NPPF uses four Flood Zones to characterise flood risk. These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences, and are detailed in Table 1.

Table 1 NPPF Flood Zones

Flood Zone	Description
Flood Zone 1 – low probability	The zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%)
Flood Zone 2 – medium probability	This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% - 0.1%), or between a 1 in 200 and 1,000 annual probability of sea flooding (0.5% - 0.1%) in any year.
Flood Zone 3a – high probability	This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
Flood Zone 3b – the functional floodplain	This zone comprises land where water *has* to flow or be stored in times of flood.

The NPPF classifies the vulnerability of developments to flooding into five categories. These categories are detailed in Table 2. Based on the vulnerability of a development, NPPF states within what Flood Zone(s) a development is appropriate.

Table 2 Vulnerability Classification

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	✗	Exception Test required	✓	✓
Zone 3b	Exception Test required	✗	✗	✗	✓
Key:					
✓ Development is appropriate					
✗ Development should not be permitted					

The flood risk vulnerability and Flood Zone 'compatibility' of developments is summarised in Table 3.

Table 3 Development Compatibility

Essential Infrastructure	• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly Vulnerable	• Police stations, Ambulance stations, Fire stations and command centres, telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes for permanent residential use. • Installations requiring hazardous substances consent.
More Vulnerable	• Hospitals • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for: dwelling houses; halls of residence; drinking establishments: nightclubs; and hotels. • Non-residential health care facilities, nurseries and educational establishments. • Landfill and sites used waste management facilities for hazardous waste. • Holiday, short-let caravan and camping sites, **subject to a specific warning and evacuation plan**.
Less Vulnerable	• Police, ambulance and fire stations which are **not** required to be operational during a flooding event.

	• Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non-residential institutions not included in 'more vulnerable' and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during a flooding event. • Sewage treatment works (if adequate measures to control pollution and manage sewage flooding events are in place).
Water Compatible Development	• Flood control infrastructure • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel workings. • Docks, marinas and wharves. • Navigation facilities. • MOD defence installations. • Ship building, repairing, and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water based recreation (excluding sleeping accommodation) • Lifeguard and coastguard installations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, **subject to specific warning and evacuation plan**.

1.4 The Sequential Test, Exception Test and Sequential Approach

The Sequential Test is a risk-based test that should be applied at all stages of development and aims to steer new development to areas with the lowest probability of flooding (Zone 1). This is applied by the Local Planning Authority by means of a Strategic Flood Risk Assessment (SFRA). The SFRA and the NPPF may require the Exception Test to be applied to certain forms of new development. The test considers the vulnerability of the new development to flood risk and, to be passed, must demonstrate that:

- There are sustainability benefits that outweigh the flood risk; and
- The new development is safe and does not increase flood risk elsewhere.

The Sequential Approach is also a risk-based approach to development. In a development site located in several Flood Zones or with other flood risks, the sequential approach directs the most vulnerable types of development towards the areas of least risk within the site.

1.5 Climate Change

The NPPF makes it a planning requirement to account for climate change in the proposed design. The recommended allowances are summarised in Table 4 below (Sourced from the Environment Agency).

Table 4 Peak rainfall intensity allowance in small and urban catchments (use 1961 to 1990 baseline)

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

2. THE SITE AND DEVELOPMENT

2.1 Existing Site

The planning application consists of the existing composting maturation facility, the proposed extension and an area dedicated to biodiversity net gain.

The proposed composting maturation area is adjacent to the existing facility, see Figure 1. The site adjacent to the existing facility is greenfield land (shaded blue for the proposed extension and the unshaded area is noted for biodiversity net gain), this consists of vegetation and a rough track to the north as shown in Figure 2. The existing facility is located to the west of the development and is shaded in green in Figure 1.

The site generally falls North to South and East to West. The lowest level on site is approximately 56.00m AOD and the highest level around 61.06m AOD.

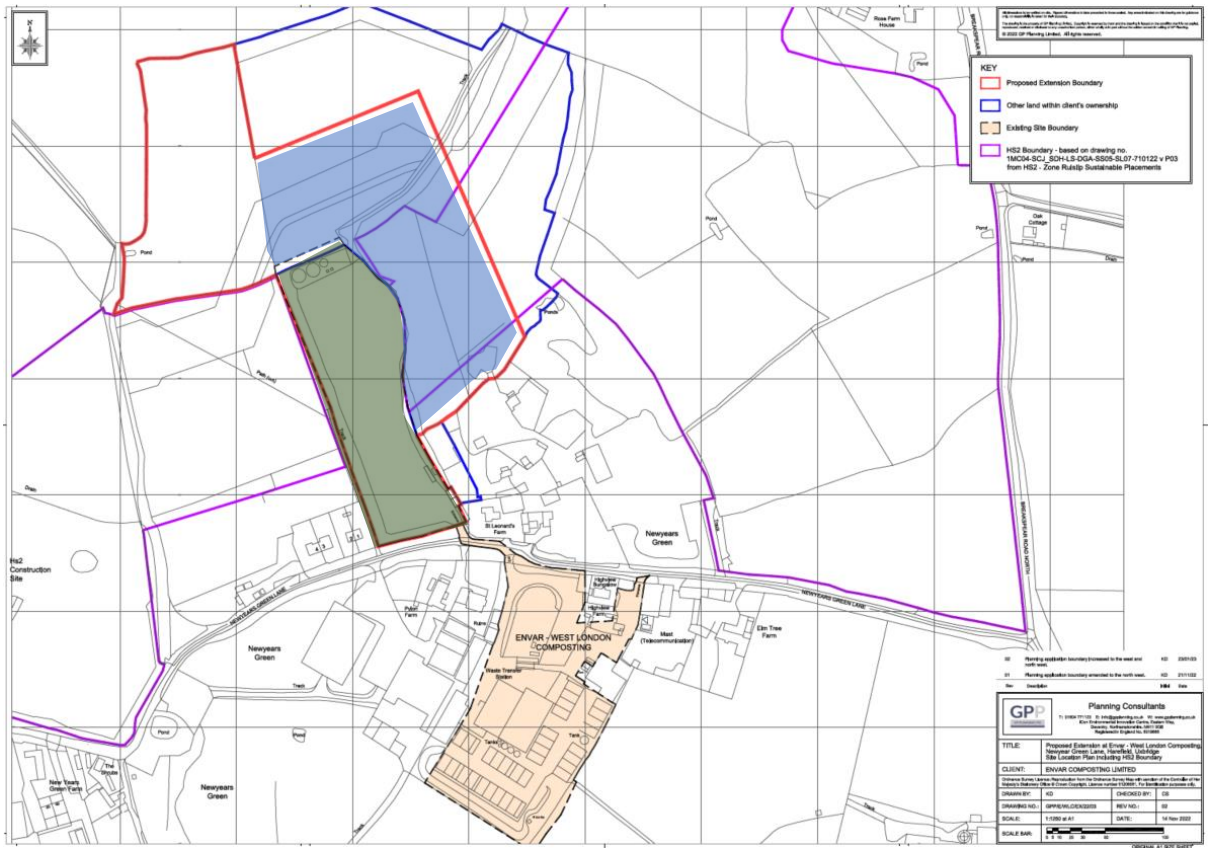


Figure 1. Shows the site boundary.

Figure 2. Google image of the site.

2.2 Geology

British Geological Survey (BGS) map (Appendix A) indicates London Clay Formation - Clay, silt and sand. Sedimentary bedrock formed between 56 and 47.8 million years ago during the Palaeogene period.

Superficial deposits are unlisted, however, boreholes within 20m of site show the presence of shallow clays.

The Llandis Soilscapes map describes the soil formation below the development as Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. Natural drainage is shown to be impeded with the area being seasonally wet. The Soilscapes map is shown in Appendix B.

2.3 Drainage Infrastructure

At the existing maturation facility, West London Composting have detailed that all surface water arising on site is contained within site.

All compost treatment areas in the northern site are isolated from the main drainage network using a combination of barrier walls, bunding and isolated and sealed drainage systems. Attenuation storage is provided to ensure that all water can be contained within site.

Water is stored in the surface water storage tanks or on the pad itself in the case of the credible worst-case event. When the surface water storage tanks reach 80% capacity, the water is collected and transported offsite by tanker to a suitably licenced facility for treatment and reuse at another facility or discharged under permit.

Drainage infrastructure on the remainder of the site beyond the existing facility is not present, being greenfield in nature.

2.4 Watercourses

The nearest watercourse to the site is an unnamed ditch network approximately 140m to the West, adjacent to the existing West London Composting facility. The watercourse runs south and is culverted below Newyears Green Lane.

2.5 Proposals

This Planning Application seeks planning permission to regularise the buildings/infrastructure on the existing green waste composting site and extend the maturation yard to the north and east. On the basis that this Planning Application is successful, one consolidating planning permission will control the green waste composting operations and the proposed Ecological Enhancement area to the north of the existing site designed to achieve Biodiversity Net Gain.

The Application Site is approximately 3.41 hectares in size and is shown edged red on the enclosed Site Location Plan (reference GPP/W/WLC/EX/22/01). Other land within the ownership of the Applicant is shown edged blue on this drawing. The Planning Application boundary includes the existing green waste composting operation (permitted under planning permission no.12579/APP/2021/2010).The new facility is being constructed to enhance the composting maturing capacity. An additional 3.17 ha of additional space shall be created as part of the development. The development shall be surrounded by a 4.5m tall earth bund. New hardstanding shall be installed to support the activities on site and prevent ingress of runoff to ground. The following is proposed:

- Laying of an impermeable concrete surface for screening, shredding, processing, storing and maturing green waste material. The site's surface will be bunded around its perimeter with a concrete curb to ensure total surface water containment;

- Construction of a perimeter landscaped screening mound using stripped soils (southern boundary only)
- The relocation of the Applicant's Site Office, Welfare Cabin, Store, Weighbridge and Weighbridge Office
- x2 500 cubic metre leachate tanks
- x2 180kV generators
- Car Parking
- Maintenance area for plant/equipment

The Application Site includes an area of land to the northeast, which will be 'non-operational' land, and is proposed to be set aside for landscape planting and ecological enhancement to ensure that biodiversity net gain is achieved in accordance with the Development Plan, forthcoming legislation, and the National Planning Policy Framework.

The proposed layout is located in Appendix C with the existing topographical survey.

3. FLOOD RISK ASSESSMENT

3.1 Flood Zone Allocation

The Environment Agency (EA) Flood map for planning (Appendix D) indicates that the proposed development site is entirely within in a Zone 1 flood risk area (i.e., there is little or no flood risk).
In accordance with Table 3 of the flood risk vulnerability classification of the technical guidance to the NPPF, the development would be classed as Less Vulnerable. The flood risk vulnerability table (Section 1.3 - Table 2) indicates that if the development is in Flood Zone 1 and is Less Vulnerable then it can be considered as an appropriate site for development.

3.2 Sequential and Exception Test

As the development is located within Flood Zone 1 the Sequential test is not required. The development compatibility table shows that the development does not require the Exception test applying.

3.3 Fluvial & Tidal Flooding

Appendix D indicates that the site is not susceptible to fluvial and/or tidal flooding.

As the development site is in Flood Zone 1, the risk is considered low and acceptable.

3.4 Pluvial Flooding

The Environment Agency pluvial flood risk is shown in Appendix E – Figure 1.0. The map indicates that the development site is generally at no risk of flooding from overland sources. Two flow paths exist as labelled on the figure, the northwestern flow path and eastern flow path.

However, there is a patch of high risk flooding located at the southern boundary of the development. Pluvial flooding has been analysed using the ScalGo's pluvial modelling package. A 150mm pluvial deluge has been added to the model to simulate a 1in100+40% storm event discharging instantaneously on the site. ScalGo maps from the modelling exercise are shown in Appendix F (Figures A to K).

Figure A shows the area of the three sites, the existing site, proposed extension area and the biodiversity net gain site. The figure shows that there are no areas on the sites which contain flooded depressions greater than 200mm during a 1in100+40% climate change event.

Figure B shows flooding within the composting heap, however, these heaps are temporary in nature and have been picked up within the LIDAR survey of the site. Therefore, the flooded depth shown is not relevant to the flood risk assessment.

The remaining Figures C – J show the depressions with flooded depths below 75mm during the 1in100+40% climate change storm event. The exception is Figure D which shown 169mm of flooding within the localised depression and that is due to the deep dip within the existing ground.

The flow path to the northwest will remain as existing as the area is to contain only ecological and planting enhancements as part of biodiversity net gain. The pathway will remain unaltered, and the levels will remain as existing.

The flow path across the proposed extension site will be encapsulated into the proposed extension drainage and the runoff shall be used in the composting process. Figure K shows that the area contributing to the flow paths from offsite comes from the adjacent industrial facility. The existing adjacent facility contains a positive drainage system, therefore, the proposed bund around the new extension site will not cut off the flow path as the flow path does not pay regard to existing drainage systems present on the adjacent site.

With the flow path to the northwest maintained and with the construction of a new drainage system on the proposed site dealing with the 1in100+40% climate change storm event, flooding from pluvial sources can be considered low and acceptable.

3.5 Groundwater Flooding

Due to the presence of clays, it is likely that there is a perched water table. Boreholes to establish the level of groundwater on site should be commissioned prior to detailed design.

The West London Strategic Flood Risk Assessment (SFRA) shows that there are no recorded ground water flooding incidents within the close vicinity of the development. The SFRA mapping in Appendix G shows that the site sits within a low risk area groundwater flooding.

Therefore, the risk of groundwater flooding is considered low and acceptable based on historic events and risk mapping.

3.6 Flooding from Reservoirs, Canals, and other artificial sources

The Environment Agency Reservoir flood map in Appendix E – Figure 2.0 shows that the site is outside the zone of influence should a reservoir fail. Desktop study shows that there are no other artificial

sources close to the development which could present a flood risk. Flood risk from reservoirs, canals and other artificial sources is therefore deemed low and acceptable.

3.7 Sewer and Drain Flooding

The SFRA mapping shows that the site is not within an area at risk of sewer flooding and no local incidents had been confirmed at the time of the report.

No further information on sewer and drain flooding within the area could be found during the desktop review, the risk is considered low and acceptable.

3.8 Flooding from the Development

Incorporating a Sustainable Urban Drainage System (SUDS) will control runoff associated with the proposed redevelopment. The proposed system should allow interception of overland flow via a series of appropriate SuDS components. An allowance of 40% additional flow for Climate Change should be added to any design calculations.

The existing strategy at the adjacent site shall be applied to the proposed site, the strategy incorporates re-use of all water on site due to the year-round demand for water in the composting process. West London Composting Limited are net importers of water with their current water reuse system at the adjacent site. The additional area for composting will create more of a water demand and therefore, all water on falling on site will be collected, stored and reused in processing. The site will be bunded to prevent any offsite discharge of runoff and or spills.

The flooding risk as a result of the development is low and acceptable.

4. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT TO FLOOD RISK

Development Considerations

In accordance with the NPPF guidance, the development will need to demonstrate that it will:

- Remain operational and safe for users in times of flood;
- Result in no net loss of floodplain storage; and
- Not impede water flows and not increase flood risk elsewhere.

4.1 Safe Access

The NPPF states that the development must provide safe access and egress during a flood event and is not impeded for emergency response vehicles, allowing safe access and egress from the site. Should the area in which the development is sited be reclassified by the Environment Agency to be within Flood Zones 2 or 3 it is recommended that the facilities management team sign up to the Environment Agency's Flood Line Warnings Direct Service.

Safe access and egress can be gained from Newyears Green Lane as shown in the flood mapping.

4.2 Loss of Floodplain Storage

As the site is located within Flood Zone 1 no loss of active floodplain will occur as a result of the development.

4.3 Sustainable Drainage Strategy

The NPFF requires that surface water arising from a developed site should as far as practicable be managed in a sustainable manner to mimic the surface water flows arising from the site prior to re-development. Opportunities to reduce the surface water run-off and the associated flood risk should be identified and climate change should be considered. Building Regulations (Part H), the NPPF and Environment Agency advice notes require the consideration of sustainable drainage techniques for new developments. Surface water drainage should be considered in accordance with a prescribed hierarchy aimed at minimizing the impact of the development.

Surface water flows should be designed to discharge to:

1. Infiltration based systems e.g., soakaways / porous pavements etc.
2. Watercourses
3. Surface water sewers
4. Combined water sewers

The biodiversity net gain area to the northeast will contain new planting and ecological enhancements. Therefore, no drainage system is suggested for the area.

The existing drainage system, bunded areas and storage tanks for the existing site contain the 1in100+40% climate change storm event. Further details can be found in Appendix J, where EPG-J000079-DS-01 Report discusses the existing drainage system and onsite pluvial runoff analysis and in Appendix K which contains the CQA Spill Mapping Assessment for the existing site. The CQA Spill Mapping Assessment notes that 1397m3 of water can be retained on site within the bunds and 1000m3 further within the storage tanks. Environment Agency regulations do not permit untreated runoff leaving the development.

The new extension/expanded development is linked to the existing site as discussed in Section 3.8. The new hardstanding areas will be bunded and runoff shall be collected and reused on site with storage in the new water tanks for operational use. The containment bund shall contain the 1in100+40% storm event runoff volume.

The Drainage Statement fromenVar for the expanded composting site is available in Appendix H.

Table 5 SUDS Checklist

SUDS Feature	Applicability
Pond/Basin	Y
Permeable Paving	N
Reservoir Paving	N
Green Roof	N
Blue Roof	N
Infiltration Features	N
Tank Systems (e.g., cellular systems)	Y
Rain garden and/or Swales	N

Table 5 lists various SUDS features and their applicability for use within the proposed development.

4.4 Maintaining Flow Paths

The pluvial flow path in the biodiversity net gain area to the northeast is to remain as existing. No level changes are suggested that would alter the current flow path and no development shall take place within the site area.

5. CONCLUSION

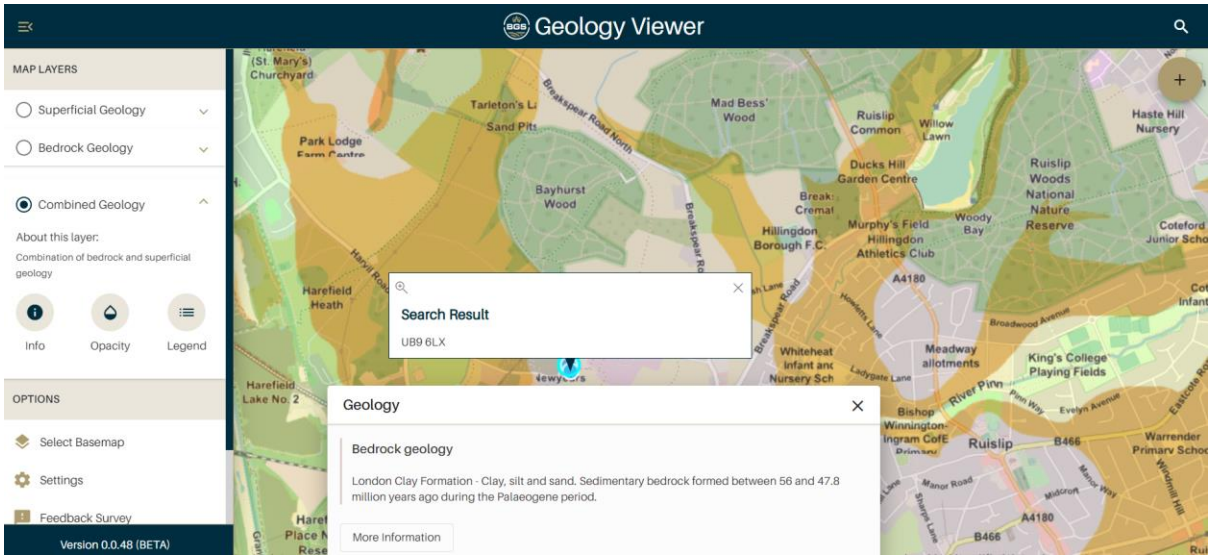
This report has considered all potential sources of flooding to the site, including sea, rivers, groundwater, land, existing sewers, artificial sources and the proposed development.

With reference to the NPPF and the Environment Agency (EA) standing advice on development and flood risk, the proposed site is located within Flood Zone 1 and is considered to be a 'less vulnerable' development. The sequential and exception test can be considered to be passed.

The site is not susceptible to groundwater flooding; however, groundwater is likely to be perched due to the presence of clays.

Appendix A

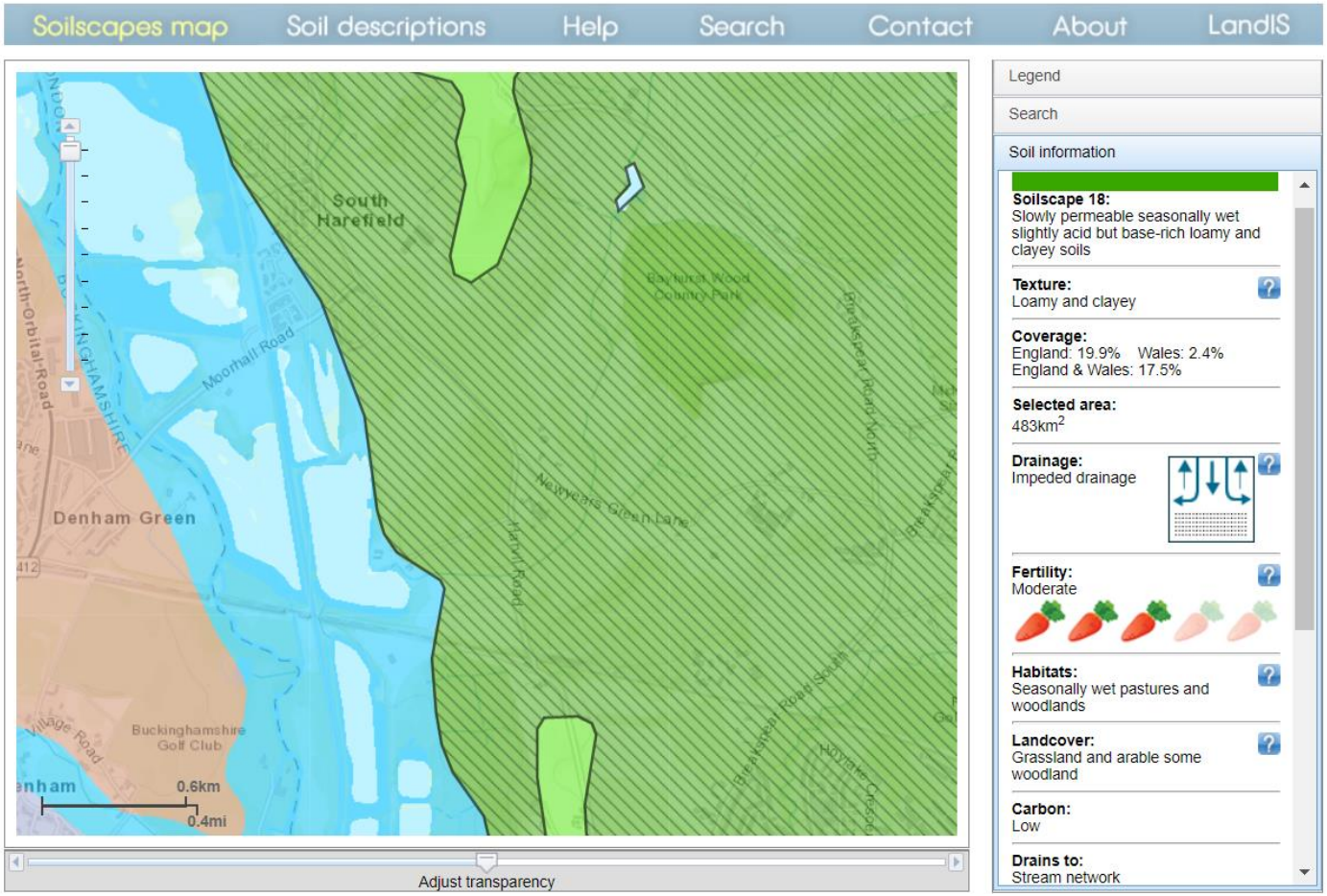
British Geological Society Map



Accessed 02.11.22 from the BGS web viewer

Appendix B

Landis Soilscapes Maps



Accessed from Llandis Soilscape website 02.22.22

Appendix C

Proposed Layout & Topographical Survey

KEY

- Proposed Extension Boundary
  Area Measurement: 72011.3327 sqm / 7.201133 ha
- Other land within client's ownership
- Existing Site Boundary

Grid Reference: X 507044 Y 188448
Postcode: UB9 6LX

Rose Farm House
Pond
BREAKSPEAR ROAD NORTH
Track
Pond
Pond
Oak Cottage
Pond
Drain
Pond
Tanks
Ponds
Path (um)
Track
Drain
Entrance
St Leonard's Farm
Newyears Green
Track
BREAKSPEAR ROAD NORTH
Hs2 Construction Site
NEWYEARS GREEN LANE
Pylon Farm
Ruins
Highview Bungalow
Highview Farm
Entrance
ENVAR - WEST LONDON COMPOSTING
Mast (Telecommunication)
Elm Tree Farm
NEWYEARS GREEN LANE
Waste Transfer Station
Newyears Green
Track
Pond
Pond
Tanks
Tank
The Shrubs
New Years Green Farm
Newyears Green
Track
Track

Rev	Description	Initial	Date
03	Planning application boundary increased to the west and north west.	KD	23/01/23
02	Planning application boundary amended to the north west.	KD	21/11/22
01	Other land within client's ownership added.	KD	19/10/22

GPP GP PLANNING LTD

Planning Consultants

T: 01604 771123 E: info@gpplanning.co.uk W: www.gpplanning.co.uk
iCon Environmental Innovation Centre, Eastern Way,
Daventry, Northamptonshire, NN11 0QB
Registered in England No. 6019666

TITLE:	Proposed Extension at Envar - West London Composting, Newyear Green Lane, Harefield, Uxbridge Site Location Plan
CLIENT:	ENVAR COMPOSTING LIMITED

DRAWN BY:	KD	CHECKED BY:	CS
DRAWING NO.:	GPP/E/WLC/EX/22/01	REV NO.:	03
SCALE:	1:1250 at A1	DATE:	10 Oct 2022
SCALE BAR:	0 10 20 30 50 100		

ORIGINAL A1 SIZE SHEET

KEY

- Proposed Extension Boundary
- Other land within client's ownership
- Existing Site Boundary
- HS2 Boundary - based on drawing no. 1MC04-SCJ_SDH-LS-DGA-SS05-SL07-710122 v P03 from HS2 - Zone Ruislip Sustainable Placements

Rose Farm House
Pond
BREAKSPEAR ROAD NORTH
Track
Pond
Pond
Oak Cottage
Pond
Drain
Pond
Ponds
Path (um)
Track
Drain
Entrance
St Leonard's Farm
Newyears Green
Track
Hs2 Construction Site
4 3
2 1
NEWYEARS GREEN LANE
Pylon Farm
Ruins
Entrance
Highview Bungalow
Highview Farm
ENVAR - WEST LONDON COMPOSTING
Mast (Telecommunication)
Elm Tree Farm
NEWYEARS GREEN LANE
Newyears Green
Waste Transfer Station
Track
Tank
Tanks
Pond
Pond
The Shrubs
New Years Green Farm
9
8
Newyears Green
Track
Track
BREAKSPEAR ROAD NORTH

Rev	Description	Initial	Date
02	Planning application boundary increased to the west and north west.	KD	23/01/23
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GPP GP PLANNING LTD

Planning Consultants

T: 01604 771123 E: info@gpplanning.co.uk W: www.gpplanning.co.uk
iCon Environmental Innovation Centre, Eastern Way,
Daventry, Northamptonshire, NN11 0QB
Registered in England No. 6019666

TITLE:	Proposed Extension at Envar - West London Composting, Newyear Green Lane, Harefield, Uxbridge Site Location Plan including HS2 Boundary		
CLIENT:	ENVAR COMPOSTING LIMITED		

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DRAWN BY:	KD	CHECKED BY:	CS
DRAWING NO.:	GPP/E/WLC/EX/22/03	REV NO.:	02
SCALE:	1:1250 at A1	DATE:	14 Nov 2022
SCALE BAR:	0 5 10 20 30 50 100		

ORIGINAL A1 SIZE SHEET

Proposed Extension

Post Development Habitat Description

Proposed Landscape Bunds - assumed mixed scrub areas

New Windrow

Native Mixed Scrub Planting Area Grass Glades and Managed Edges

0 125 250 METRES

N

Rev	Description	Date

Purposed of Issue
PLANNING

Bradley Murphy Design Ltd
6 The Courtyard
Hatton Technology Park
Dark Lane
Hatton
Warwickshire
CV35 8XB

t: 01926 676496
e: info@bradleymurphydesign.co.uk
www.bradleymurphydesign.co.uk

Date: 03/01/2023

Client
ENVAR COMPOSTING LTD

Project
HAREFIELD COMPOSTING FACILITY

Drawing Title
POST - DEVELOPMENT HABITAT PLAN: HAREFIELD EXTENSION

Drawn	Checked	Approved	Date:
SR	JW	JP	03/01/2023

Job No.	Scale	Sheet Size	Revision
21.0069	1:1000	A3	A

Drawing Number
BMD.21.0069.DRE.903

N
W E
S

NOTES

1. TOPOGRAPHICAL SURVEY INFORMATION SHOWN ON THIS DRAWING IS BASED UPON THE ORDNANCE SURVEY NATIONAL GRID HEIGHT AND PLAN DATUM DERIVED BY G.P.S.(OSTN02,OSGB36).

2. WHILST EVERY EFFORT HAS BEEN MADE TO INCLUDE ALL ACCESSIBLE DETAIL, SOME FEATURES MAY NOT BE SHOWN IF OBSCURED AT THE TIME OF SURVEY (e.g. PARKED VEHICLES).

3. THE ACCURACY OF THIS SURVEY IS COMMENSURATE WITH THE DRAWING SCALE SPECIFIED WITHIN THE TITLE BLOCK. ALL CRUCIAL DIMENSIONS SHOULD BE CHECKED ON-SITE.

LEGEND

BOL	Bollard	GV	Gas valve	SV	Sluice valve
LB	Litter bin	FH	Hydrant	ST	Stop tap
BS	Bus stop	IC	Inspection cover	S.R.R.	Speed retarder ramp
CATV	Cable television cover	KO	Kerb outlet	TL	Traffic light
DR	Drain	PB	Letter box	TP	Telegraph pole
DP	Down pipe	LP	Lamp post	T.P.S.	Tactile paving slabs
EP	Elec. pole	MH	Manhole	VP	Vent pipe
ER	Earth rod	NP	Name plate	WM	Water meter
FP	Flagpole	PO	Post	WO	Water outlet
G	Gully	PM	Parking meter		
BT	Inspection cover (Communications)	RE	Rodding eye		
		RS	Road sign		

C/L HT 2.0m — Fence

Gate

Tree

FENCE TYPES

B/W	Barbed wire
C/B	Closed boarded
C/I	Corrugated iron
C/L	Chain link
C/P	Concrete panel
H/R	Hand rail
I/R	Iron railings
O/B	Open boarded
P/C	Post & chain
P/R	Post & rail
P/W	Post & wire
W/M	Wire mesh

APPROX POS. OF O/H WIRES — OVERHEAD CABLES/WIRES

Buildings

Edge of Vegetation

50.00 + Spot level

STA 101 25.75 △ Survey control station with ID and Level

Revision	By	Chk'd By	Date	Comments
0	JC	RLM	03/12	TOPOGRAPHICAL SURVEY

West London Composting

SLR
ASPECT HOUSE
ASPECT BUSINESS PARK
BENNERLEY ROAD
NOTTINGHAM. NG6 8WR
T: 01159 647280
F: 01159 751576
www.slrconsulting.com

Client
WEST LONDON COMPOSTING

Project
TOPOGRAPHICAL SURVEY

Drawing Title
NEWYEARS GREEN LANE
FEBRUARY 2012

Scale	Date
1:750 @ A1	FEBRUARY 2012

Drawing Number	Revision
001	0

00996.00006.002.19.001.0_NEWYEARS03!2.dwg

Appendix D

Environment Agency Flood Map for Planning

Appendix E

The Environment Agency Flood Maps

Figure 1. Surface water flood risk

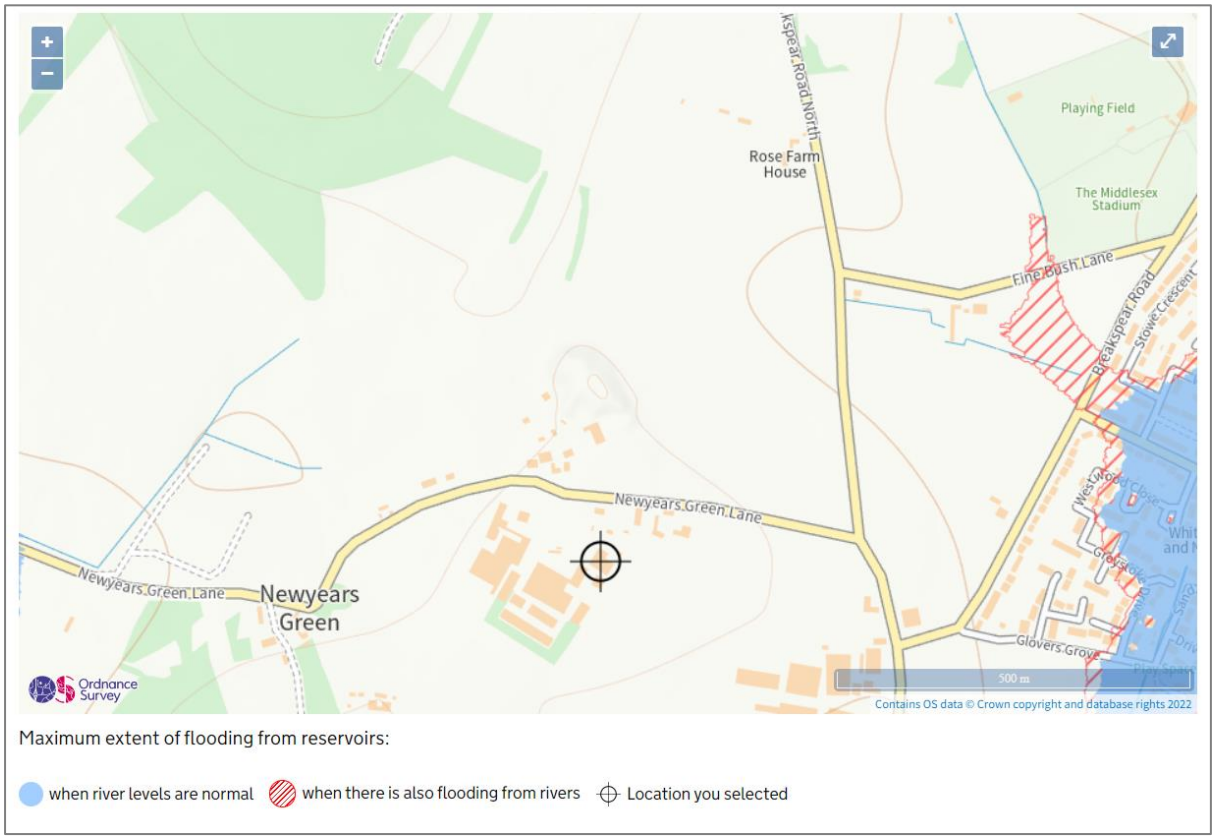


Figure 2. Maximum extent of flooding from reservoirs

Appendix F

ScalGo Analysis and Mapping

Figure A – Flooded depths and site area (depth banding as shown)

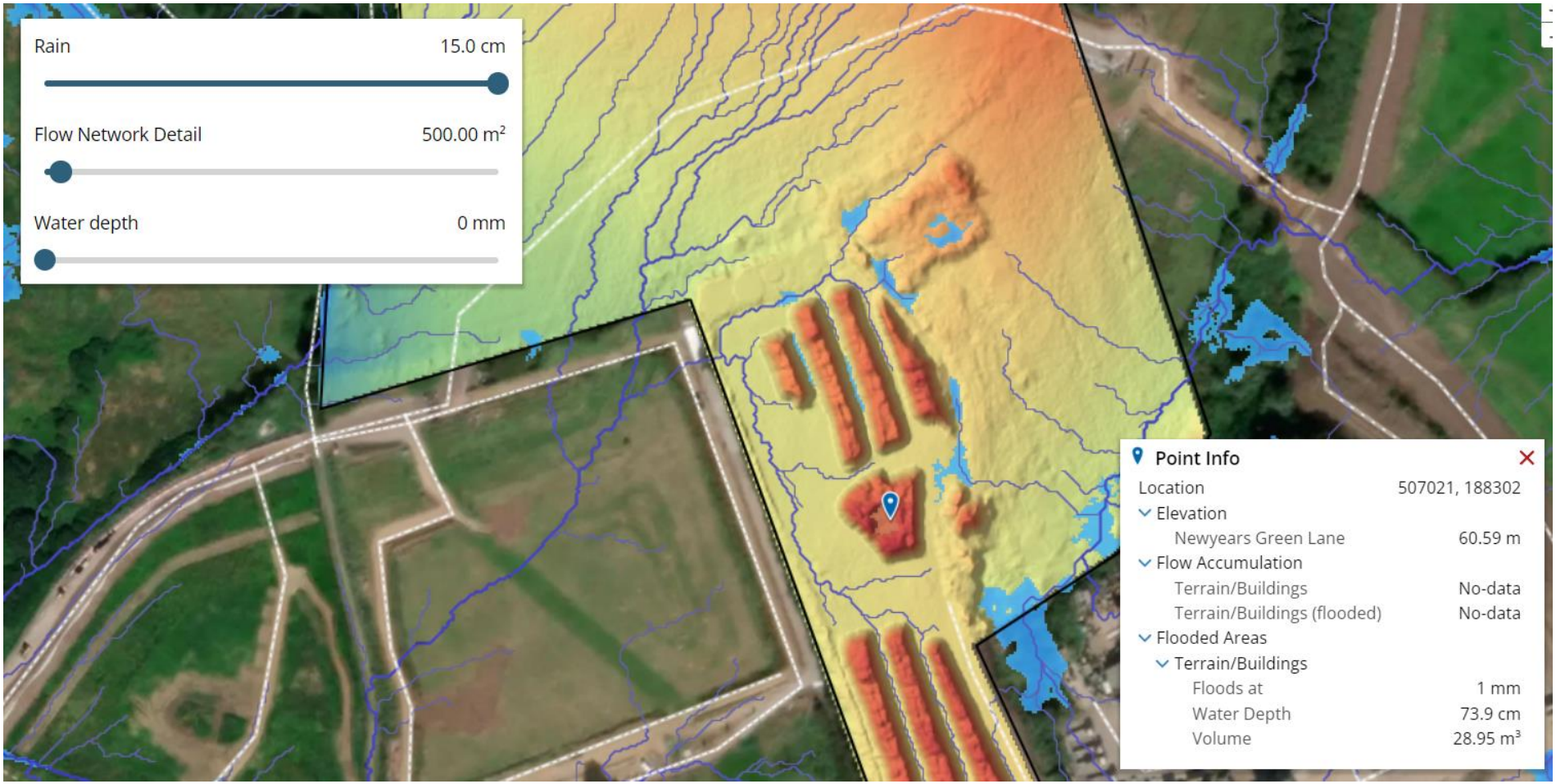


Figure B – Flooded depth on top of compost heap (compost heaps are temporary during composting process)

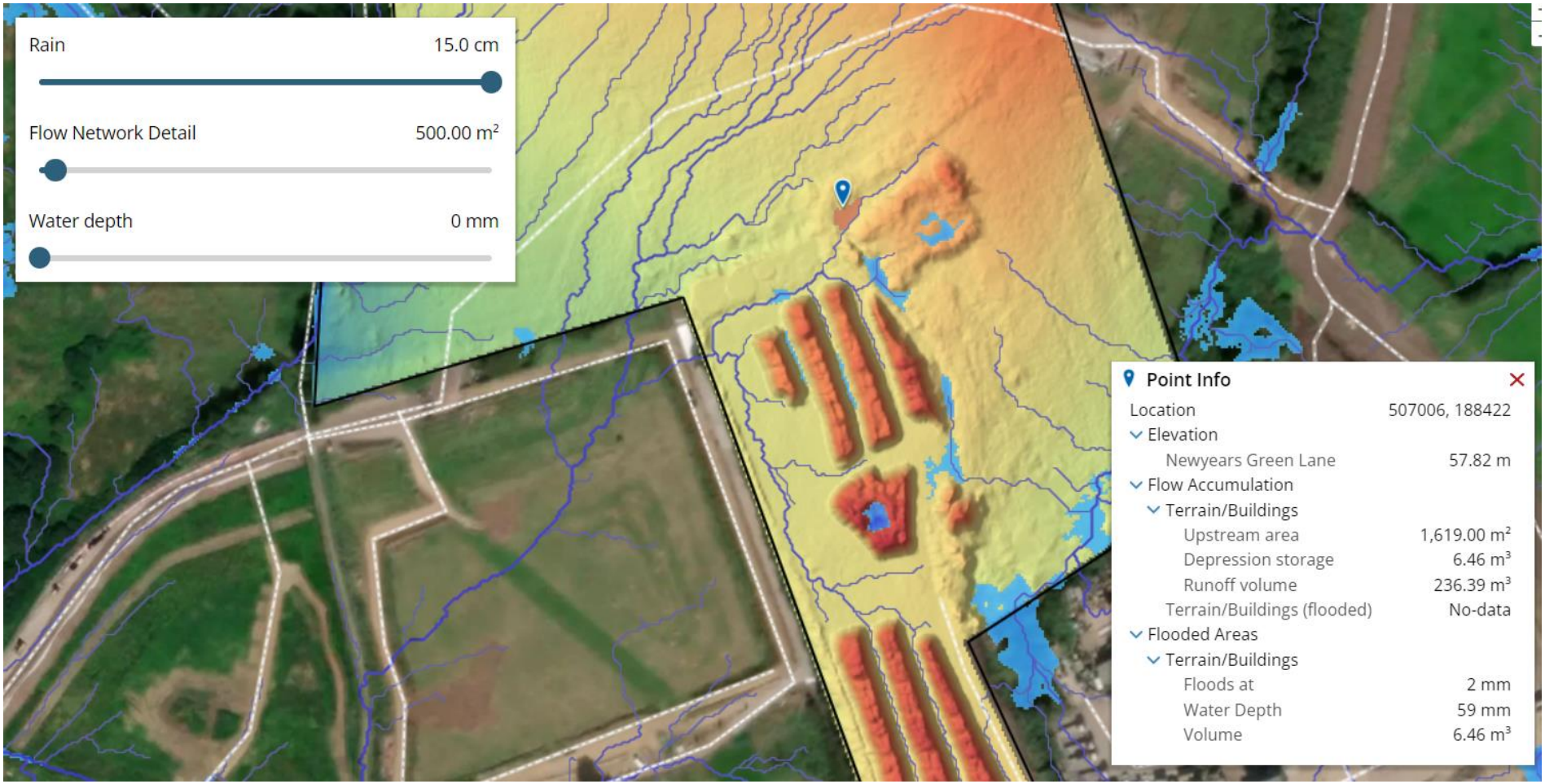


Figure C – Flooded depth on expansion site

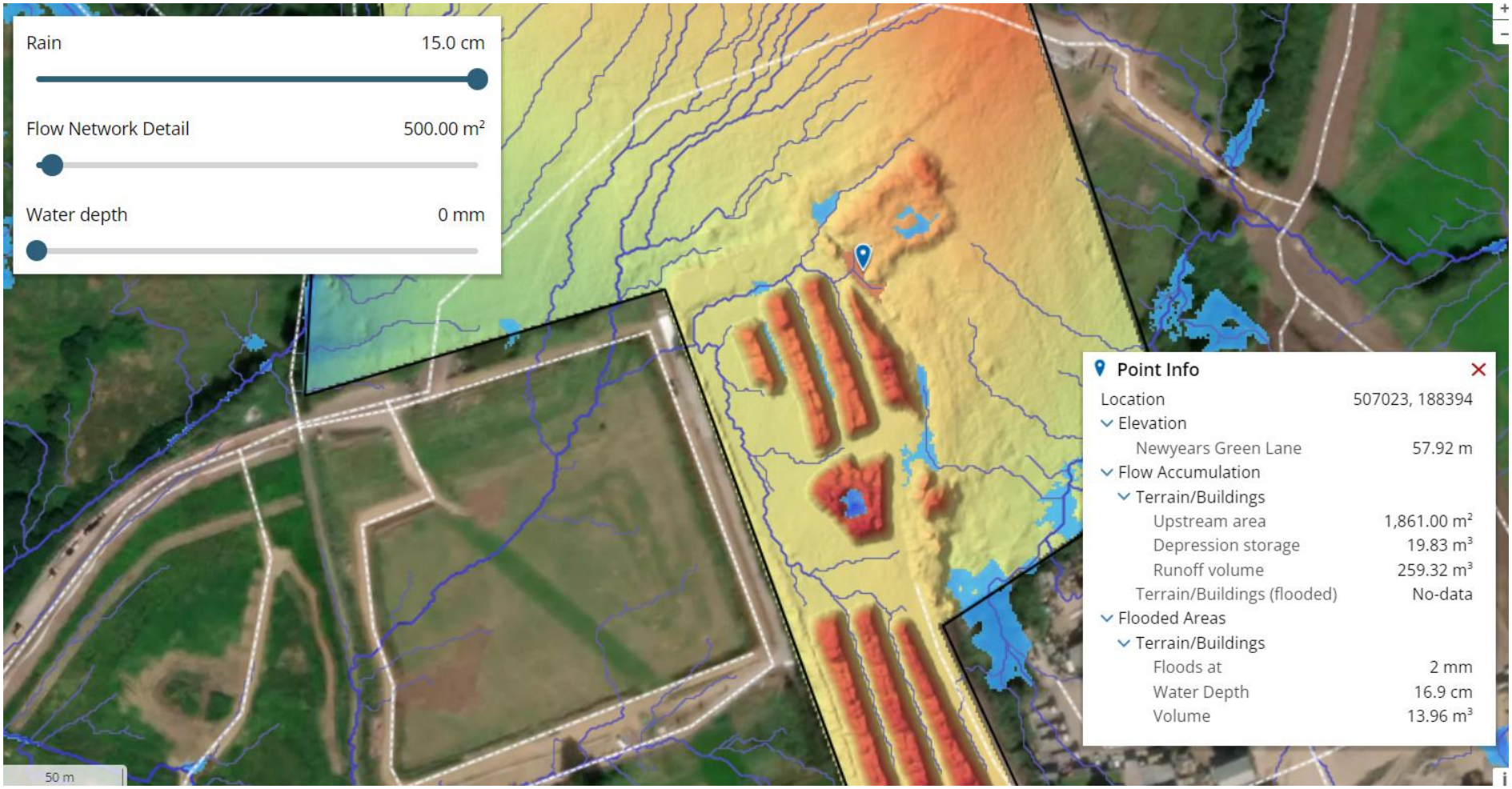


Figure D – Flooded depth on expansion site

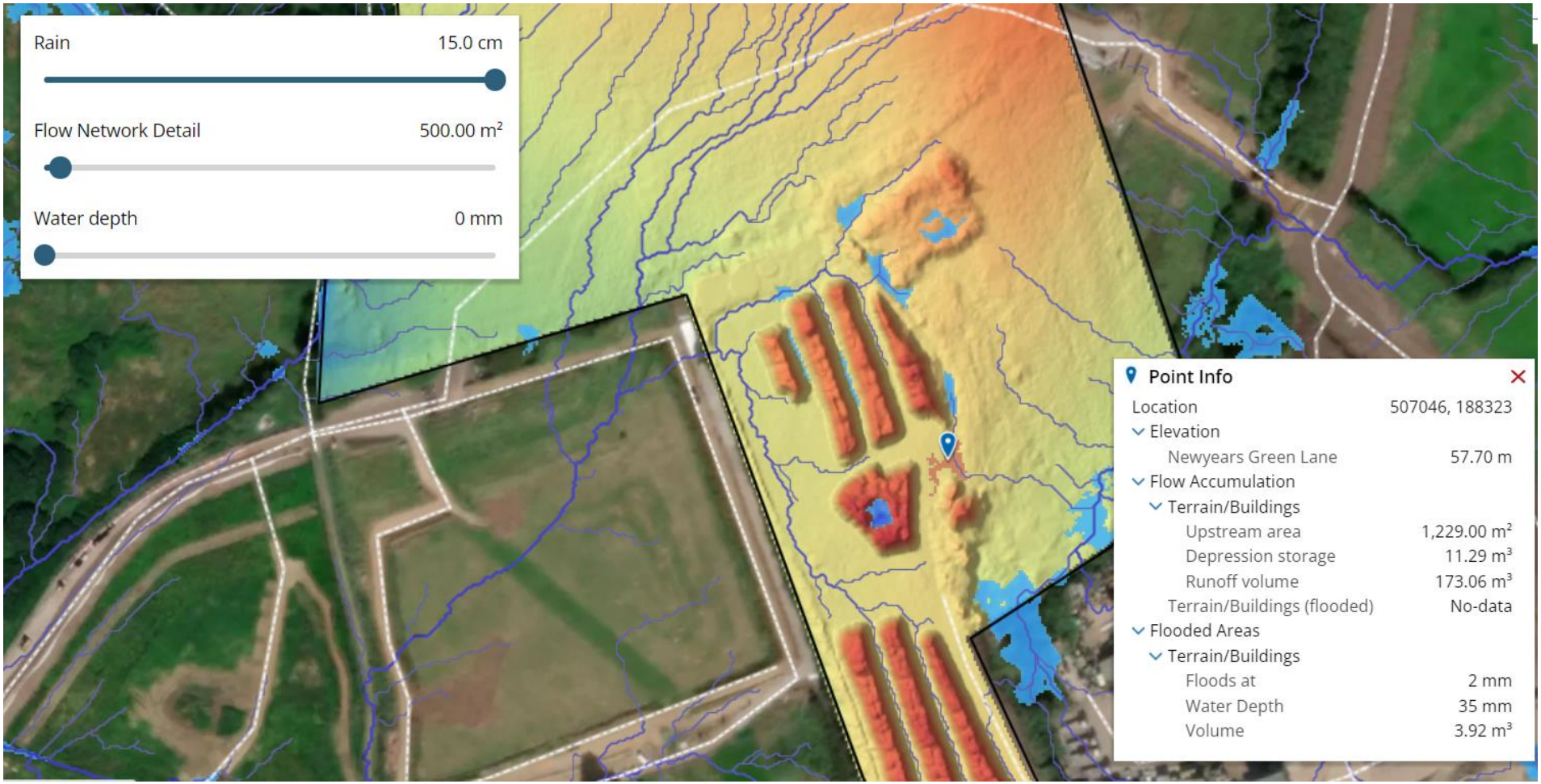


Figure E – Flooded depth on expansion site

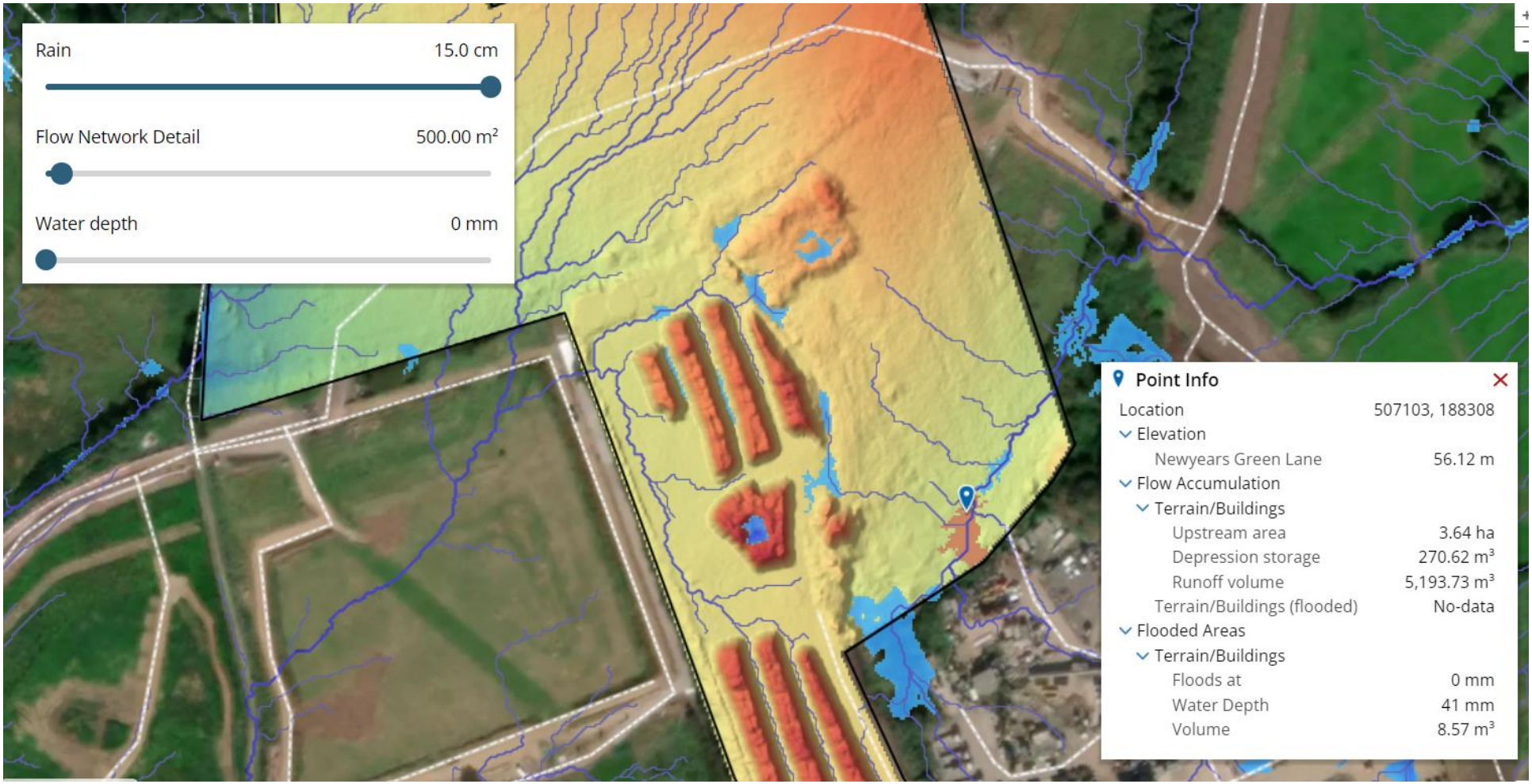


Figure F – Flooded depth on expansion site (existing flow path)

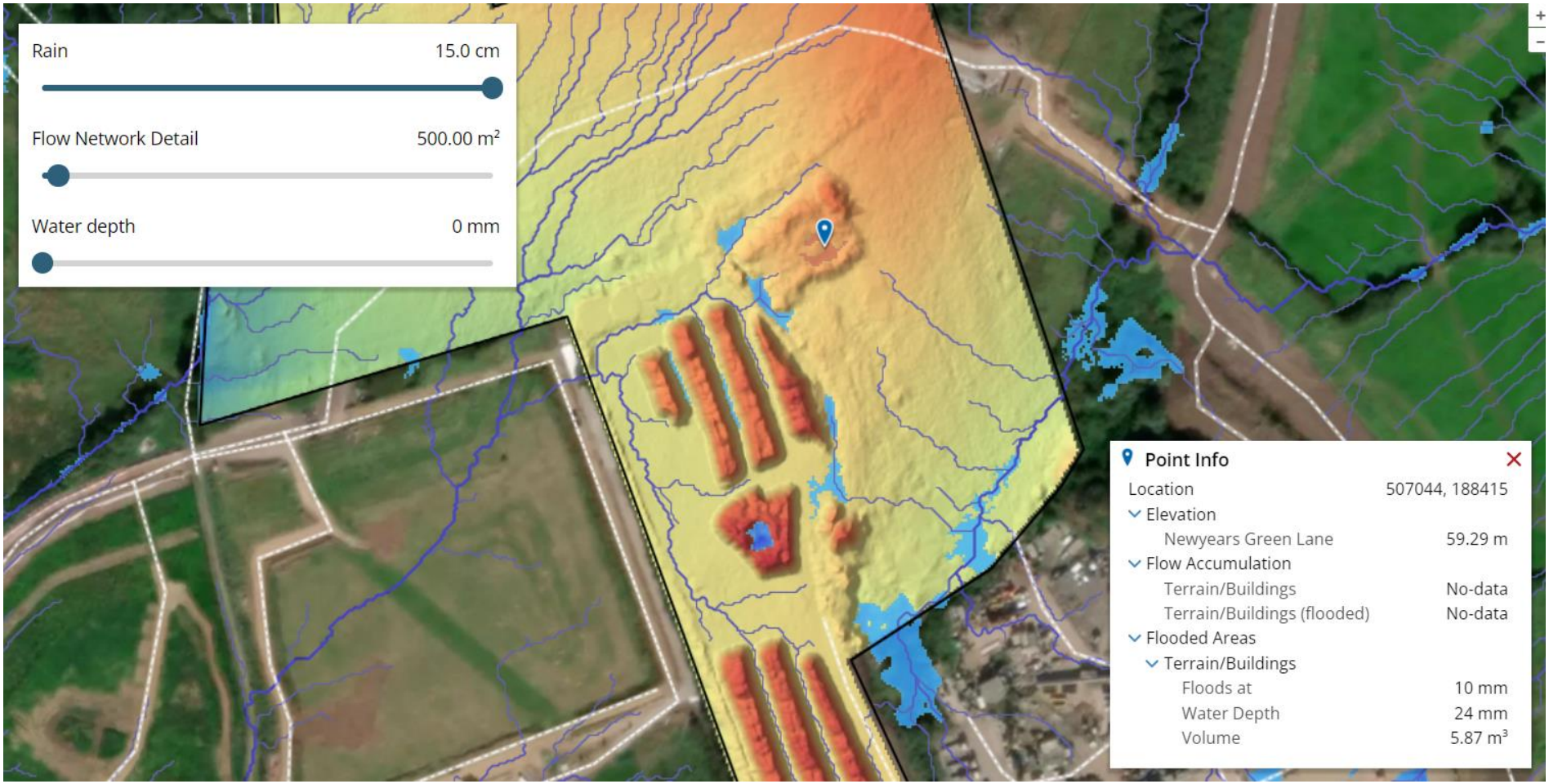


Figure G – Flooded depth on expansion site

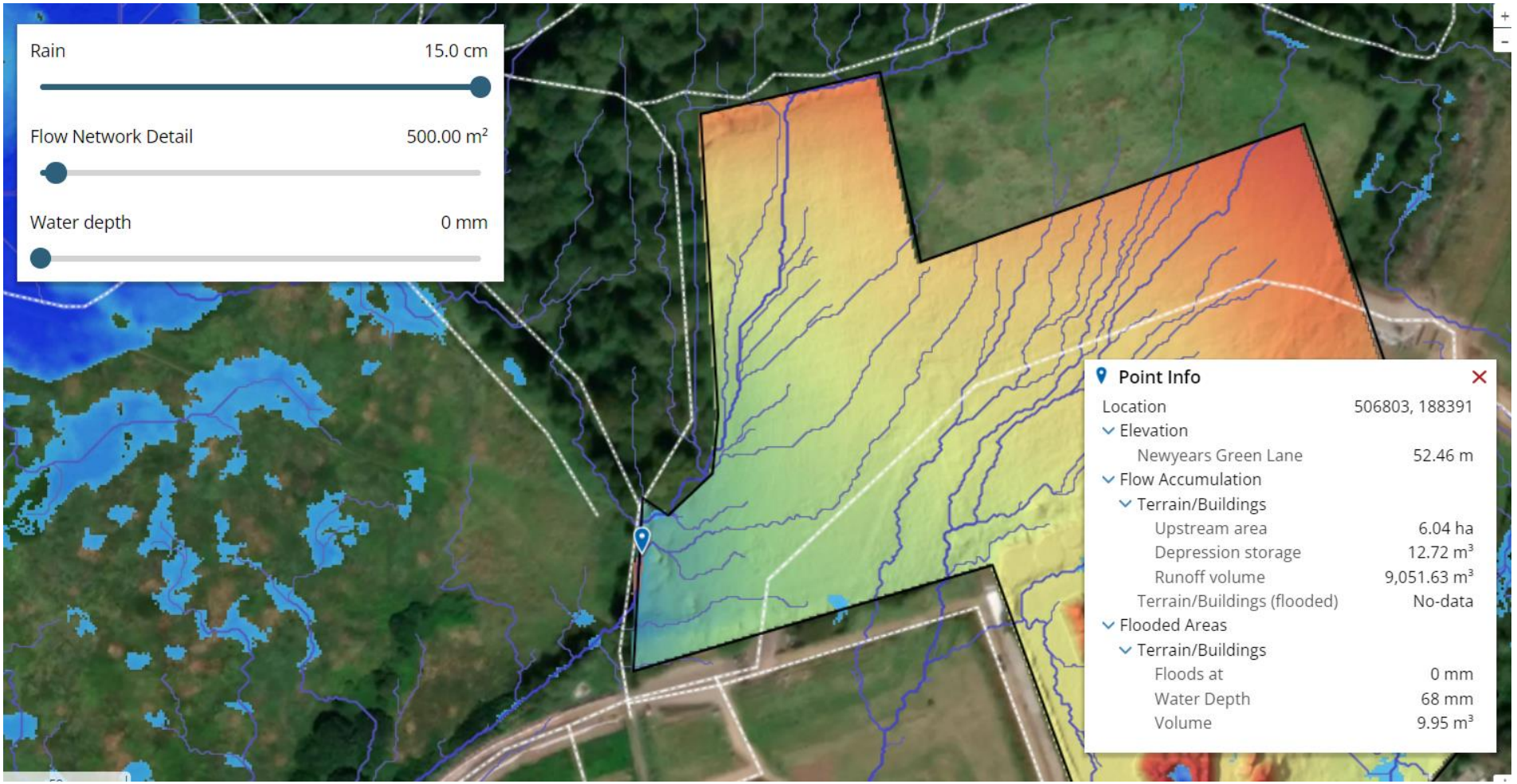


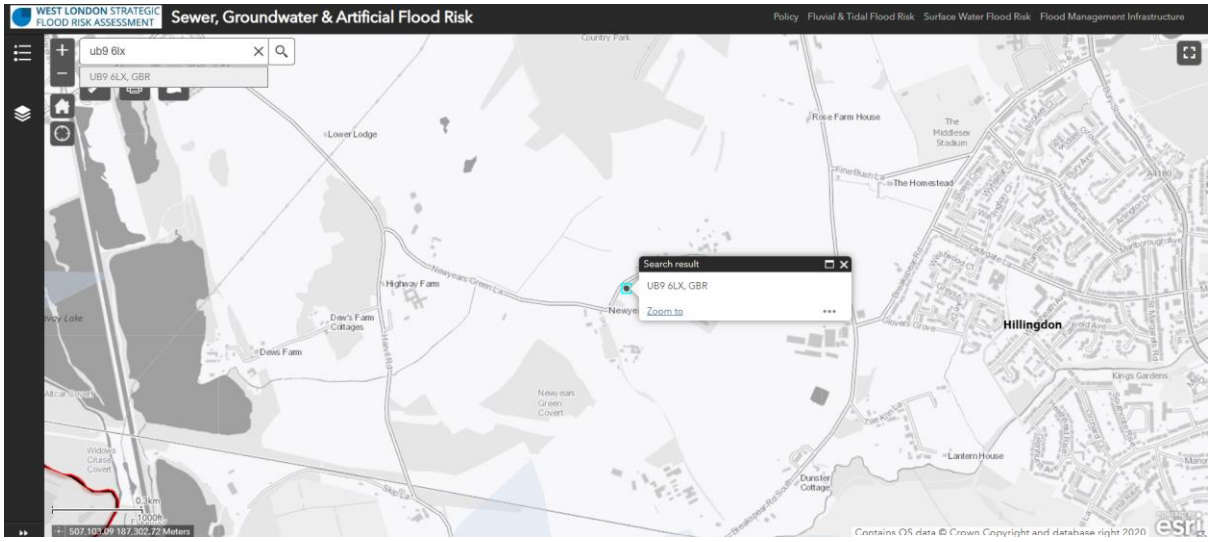
Figure H – Flooded depth on biodiversity net gain site (within flow path)

Figure J – Flooded depth on expansion site (within existing flow path depression)

Figure K – Catchment area for eastern flow path

Appendix G

West London SFRA Mapping


WEST LONDON STRATEGIC FLOOD RISK ASSESSMENT
Sewer, Groundwater & Artificial Flood Risk
Policy
Fluvial & Tidal Flood Risk
Surface Water Flood Risk
Flood Management Infrastructure
ub9 6lx
UB9 6LX, GBR
Search result
UB9 6LX, GBR
Zoom to
Lower Lodge
Rose Farm House
The Middlesex Stadium
The Homestead
Highway Farm
Daw's Farm Cottages
Dews Farm
Hillingdon
Kings Gardens
Lantern House
Dunster Cottage
Contains OS data © Crown Copyright and database right 2020
esri

Appendix H

enVar Drainage Statement

05/12/2022

DRAINAGE STRATERGY – WEST LONDON COMPOSTING, NORTH SITE EXTENSION

CONTENTS

CONTEXT

West London Composting Limited, which is owned and operated by Envar composting, part of the Heathcote Holdings Group of companies is seeking to extend its operational areas at the West London Composting site in Hillingdon area of West London.

There are various reasons for the business needing to extend its operation. These include legislative change, the requirement to be more energy efficient and the increased local requirement for effective waste processing. Legislative change has meant there is a greater emphasis on smaller rows of material and stockpiles which a greater surface area to minimise heat retention. Efficiency measures extend to both the site operations and beyond it with a reduced need for long distance transport, and efficiencies on site smaller rows and the investment in better machinery reduces the sites carbon emissions and allows the business to effectively service the needs of the local authority.

The land in question is located on the northern side of the New Years Green Lane between the lane and Ruislip Woods. The land in question is all within the ownership of the business and is currently being used as a stockpiling area (temporary) for HS2 operations.

West London Compositing have prepared this report to outline the strategy behind its surface water management requirements and in the context of the Environment Agency requirements for the containment of potentially polluting liquids.

The composting process consumes significant quantities of water during the process of aerobic composting with between a thirty and forty percent moisture loss during the break down process. For this reason, the business aims to capture and store as much rainwater as is possible on site for efficiency and financial reasons. In addition, the rain which falls on site cannot be discharged without ensuring compliance to a discharge permit supplied by the EA. Therefore, it is collected for use to replace potable mater.

This report lays out the detailed process which shall be followed to ensure the site is built in line with all the relevant legislative requirements and construction standards. The report is not intended to replace a “detailed design” or full CIRIA risk assessment. CIRIA is the Construction Industry Research and Information Association, a neutral, independent, and not-for-profit body who produce guidance for relevant industries, the guidance produced by them relating to liquid management is known as Containment systems for the prevention of pollution (C736F). under the environmental permitting process there is a requirement to follow this for design and construction.

Drainage Strategy

i. There shall be no off-site discharge of any surface water
ii. The site shall be built on a sealed impermeable surface
iii. There are no points of surface water infiltration into the soil or groundwater
iv. Should the site wish to discharge to surface water in the future a discharge consent shall be sought from the environment agency and appropriate standards shall be achieved.
v. The site shall be designed by a qualified engineer in line with the recommendations of accepted industry practice guidance known as CIRIA 736
vi. All site water shall be collected on site for reuse in specially built containment
vii. Any excess shall be taken by road for treatment unless further measures are implemented as per point iv.

DESIGN

Basic & Detailed Design

The site shall have a preliminary basic design completed which shall give an overview of the requirements of the materials needed for construction the basic materials and design of bunding and water containment. The report shall outline, that subject to planning a full design shall be undertaken which shall include the specifics of the water catchment and the site containment ability. The design shall incorporate the site capacity as a sealed surface with the addition of storage tanks.
CIRIA follows a risk assessment-based approach. The risk assessment considers the risk of any weather events occurring or occurring simultaneously and makes a realistic worst case scenario assessment which is used to calculate how much water the site will need to contain in the event of this occurring. The site is then designed in line with the recommendation and constructed as such.

Future Improvements

The site may in the future look to construct a specialist water treatment plant to allow the treatment of the water to standard which is acceptable to the EA to be discharged off of the site. This would require an environment agency agreed discharge license which

would contain details of water quality and flow rates should it be applied for and achieved.

Appendix J

EPG Report on the Existing Site

Part of the STRI Group

epg

The Environmental Protection Group Ltd

Pluvial Flood Review Addendum at enVar, Uxbridge

enVar

Uxbridge

EPG-J000079-DS-01
29.03.22

The Environmental Protection Group
John Roberts

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Project No: EPG J000079 Prepared by: John Roberts Date: 29.03.22

Revision	Purpose	Date
V1.0	First Issue	25.03.22
V1.1	SW client notes added.	29.03.22

Prepared By:

John Henry Roberts
Principal Civil Engineer

Rod Green MSc, BSc(Hons), IENG, FCIPHE, FSoPHE
Principal Public Health Engineer

Contents

Appendix

1 INTRODUCTION

enVar Composting Ltd has commissioned EPG to deal with comments 34 to 36 of the Greater London Authority Planning Report in relation to the surface water flooding risk at the Northern site (see Figure 1) of the Uxbridge enVar site. EPG will also provide a summary of the drainage and water reuse on site to supplement the CQA WLA Containment Assessment (CQA) produced for planning. The information will supplement information previously provided within previous reports with answers to comments 37 to 40 from the Greater London Authority Planning Report.

The site is located at 1 Newyears Green Ln, Newyears Green, Harefield, Uxbridge UB9 6LX. The following report is generated in relation to London Borough of Hillingdon application number 12579/APP/2021/2010.

Figure 1 Site Location Plan

2 SURFACE WATER FLOODING

Comments 34 and 36 of the Greater London planning report are extracted and shown below for information :

Flooding

34 The site is in Flood Zone 1 and is greater than 1 hectare in area. A Flood Risk Assessment (FRA) has been submitted as required under the National Planning Policy Framework (NPPF). The Environment Agency Flood Risk from Surface Water mapping shows an area of 'high risk' pluvial flooding to the east of the northern site boundary. In the design 'medium risk' scenario, predicted flood depths are up to 900mm.

35 The 'existing surface water management system on northern site' Figure 8 in the FRA shows that there is no kerb edge to the tarmac pad along the eastern site boundary. There could therefore be a risk of surface water encroaching within the site from this area identified at high risk of pluvial ponding. Figure 10 in the FRA shows that a kerb is recommended along the eastern edge of the site, however, it is not certain whether this recommendation has been incorporated into the scheme. Therefore, the FRA should include additional assessment of the topography in the area to ascertain the risk of pluvial flooding encroaching within the site. Further commitment to incorporate the kerb along the eastern site boundary should be provided, as well as confirmation that the proposed level of the kerb provides adequate protection. The FRA adequately assesses the risk of flooding from fluvial/tidal, sewer, groundwater, and reservoir flooding, which is considered to be low.

36 The FRA provided for the proposed development does not comply with London Plan Policy SI12, as it does not give appropriate regard to the risk of pluvial flooding from the east of the northern site. Further assessment of levels should be provided to quantify the risk and inclusion of appropriate mitigation measures should be confirmed.

Figure 2 Extract from Comments document

The above points shall be dealt with by reviewing the surface water flood risk posed to the Northern site. EPG shall review the Environment Agency's (EA) long term pluvial mapping alongside ScalGo modelling. ScalGo is a LIDAR and Site Data based pluvial flood modelling package which is used to simulate various rainfall events and depths at a development location.

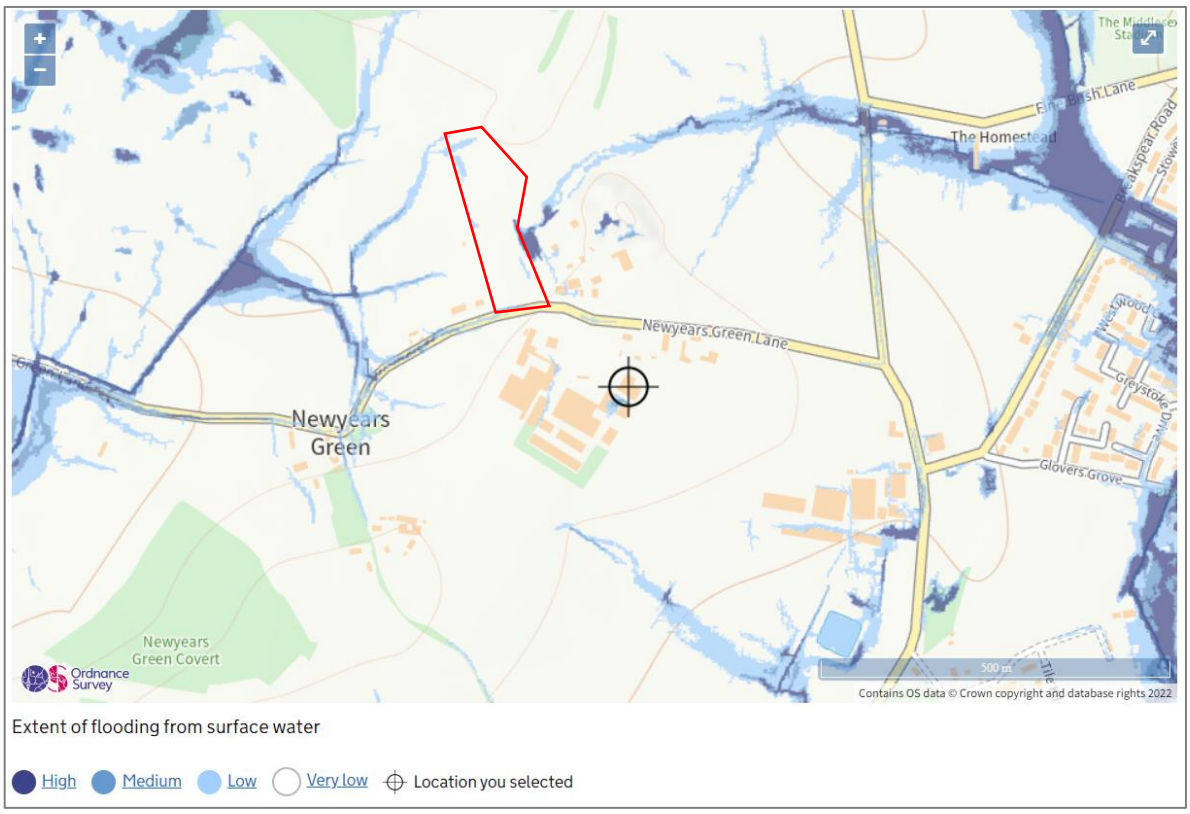

Figure 2 EA Pluvial Flood Mapping

The above image (figure 2) was downloaded from the EA's website and the Northern development is outlined in red. It can be seen that the site features a number of patches of low/medium pluvial flooding areas, however, the extent is limited. The high risk flooding area to the east is outside of the site boundary and will have no impact to the development, as will be proven via modelling in subsequent report sections.

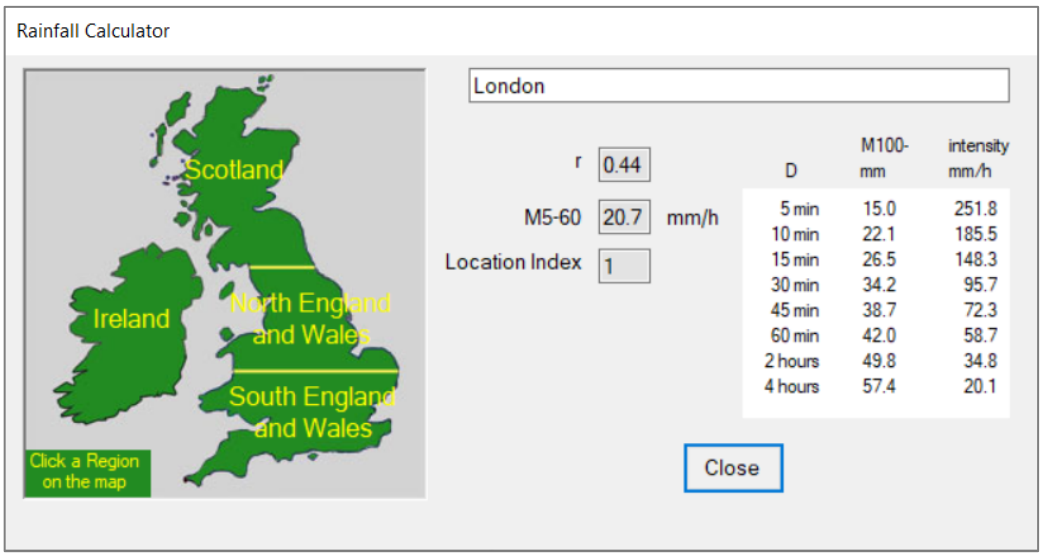

Figure 3 1in100 year + 40% FSR rainfall intensities

Figure 3, above, shows the rainfall intensities for London, the worst case being 251.8mm/hr for the 5 min storm event. This intensity has been used in the below ScalGo model maps within the following ground profile report section and catchment/depth analysis. The rainfall rate has been run for an hour to allow for a pluvial deluge of 251.7mm of rainfall. It should be noted that this scenario vastly exceeds a typical storm event.

2.1 Ground Profiles

Figure 4 Profile of ground levels at High Risk area of pluvial flooding – off site

The above, Figure 4, shows that the High Risk area of flooding off site will not impact on the development. The natural topography forms a bund from c.56.4m AOD to 57.9m AOD (i.e. 1.5m high). Based on the 251.8mm rainfall intensity, the maximum rainfall depth is 25.1cm as shown on the blue line. Therefore, it can be concluded that the High Risk area will remain in the existing depression adjacent to the development.

It is understood that a 400mm diameter culvert conveys water from the offsite depression below the site to discharge beyond the development to the West. enVar have confirmed the culvert is in good Comment and state of repair.

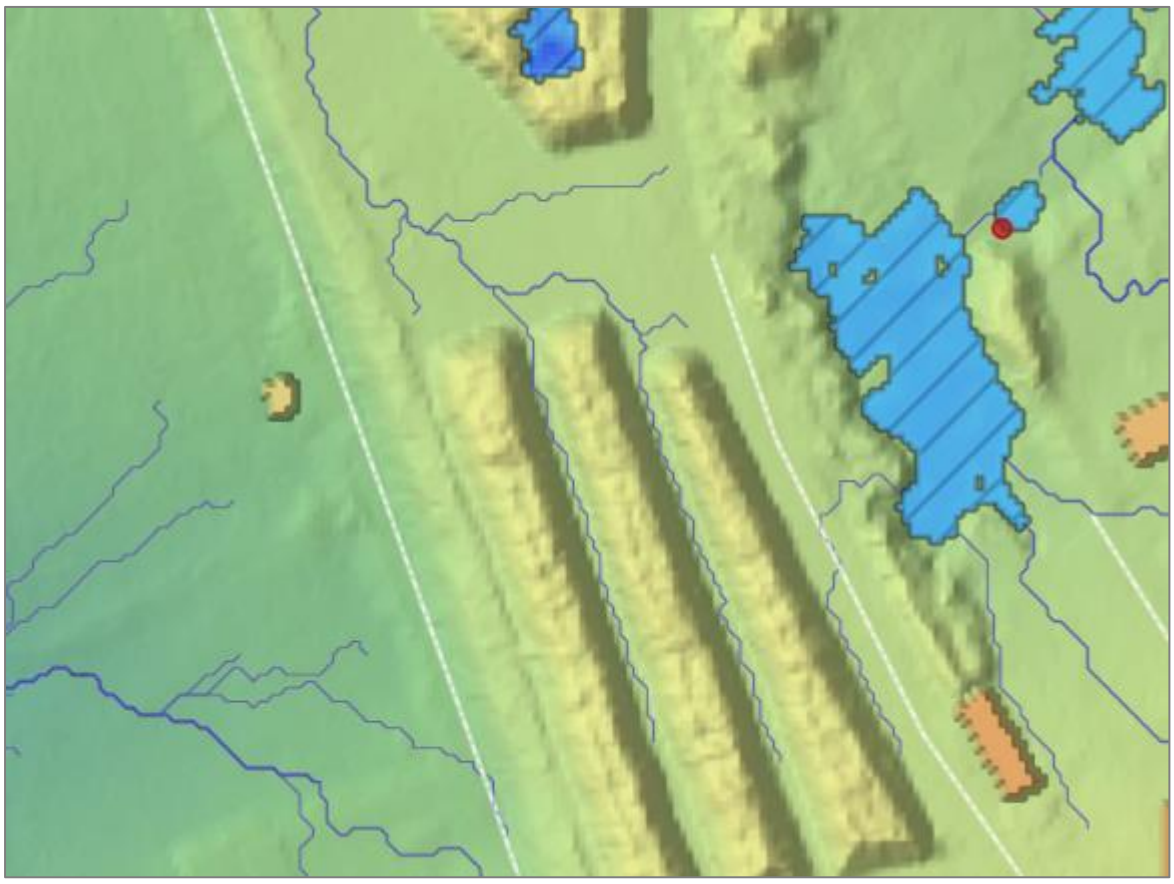

Figure 5 3D Model

The model in Figure 5 shows the naturally topography difference between the development site and the area adjacent. It can be seen that site is protected from the area of high risk by the natural bund.

Figure 6 Profile of small depression to the North, adjacent to the storage tanks

Figure 6 highlights the extent of flooding within the northern area is vastly reduced compared to the Environment Agency mapping. ScalGo utilises topographical data supplemented with LIDAR, creating a realistic ground model. The spacing of the levels, accuracy and depression areas show a minimal extent of surface ponding. The extent of the flooding in the 251.8mm deluge is shown by the blue line. This area will be discussed in greater detail in the catchment analysis, as a flow path can be seen to extend into and beyond site.

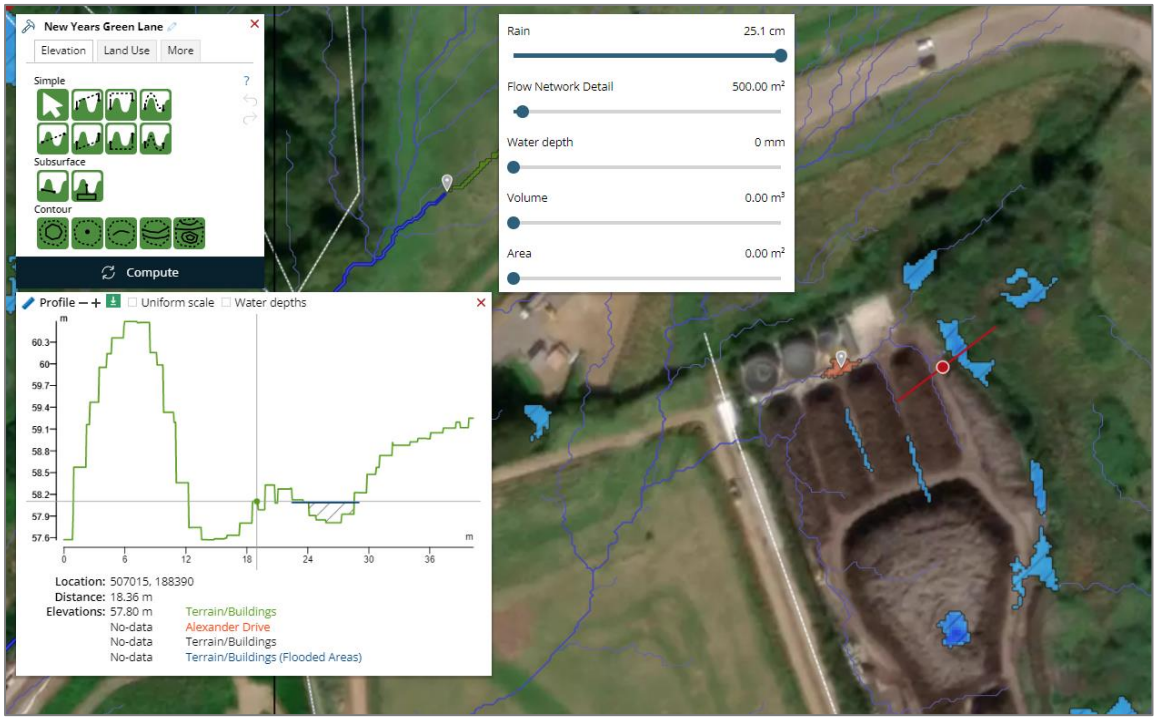

Figure 7 Profile of an area of flooding offsite to the North East

The above figure shows a natural depression and bund preventing runoff from this area from coming onto the development. The catchment analysis will discuss this offsite area in more detail. The extent of the flooding in the 251.8mm deluge is shown by the blue line.

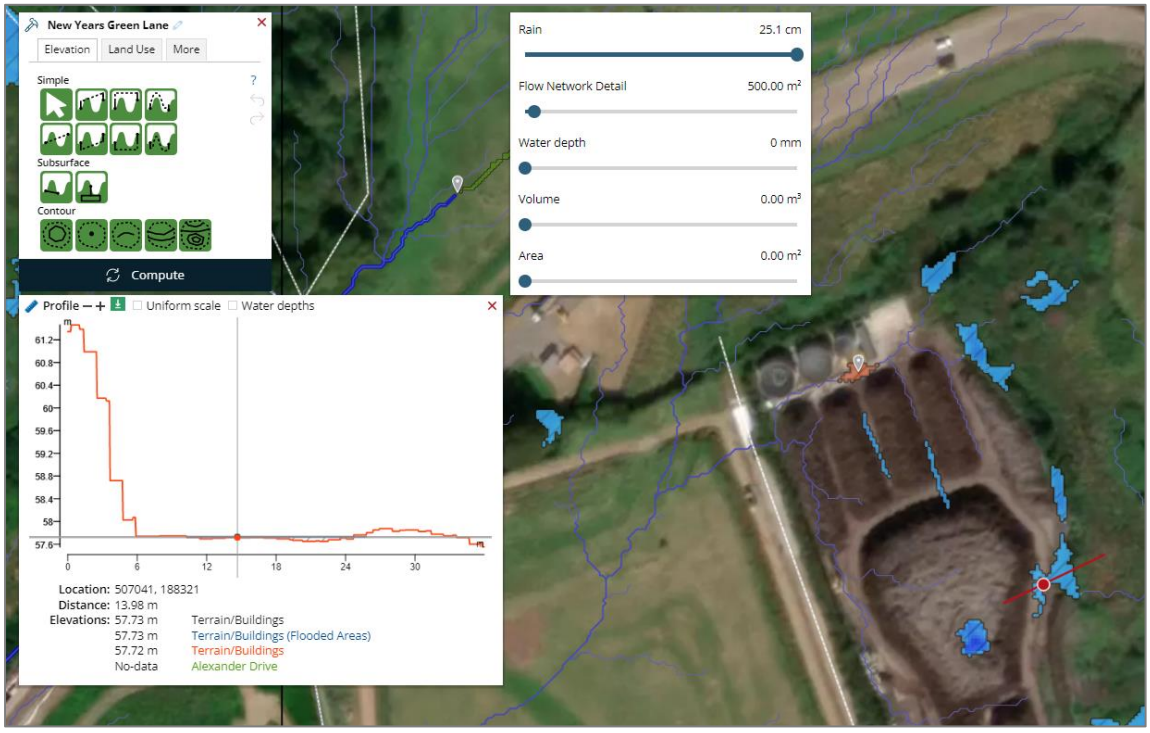

Figure 8 Profile of flat track area

The figure above shows that the flooded area is limited, shallow and arises on site. The area outside of the site is prevented from surcharging the site due to the existing topography. The extent of the flooding in the 251.8mm deluge is shown by the blue line.

2.2 Catchment and Depth Analysis

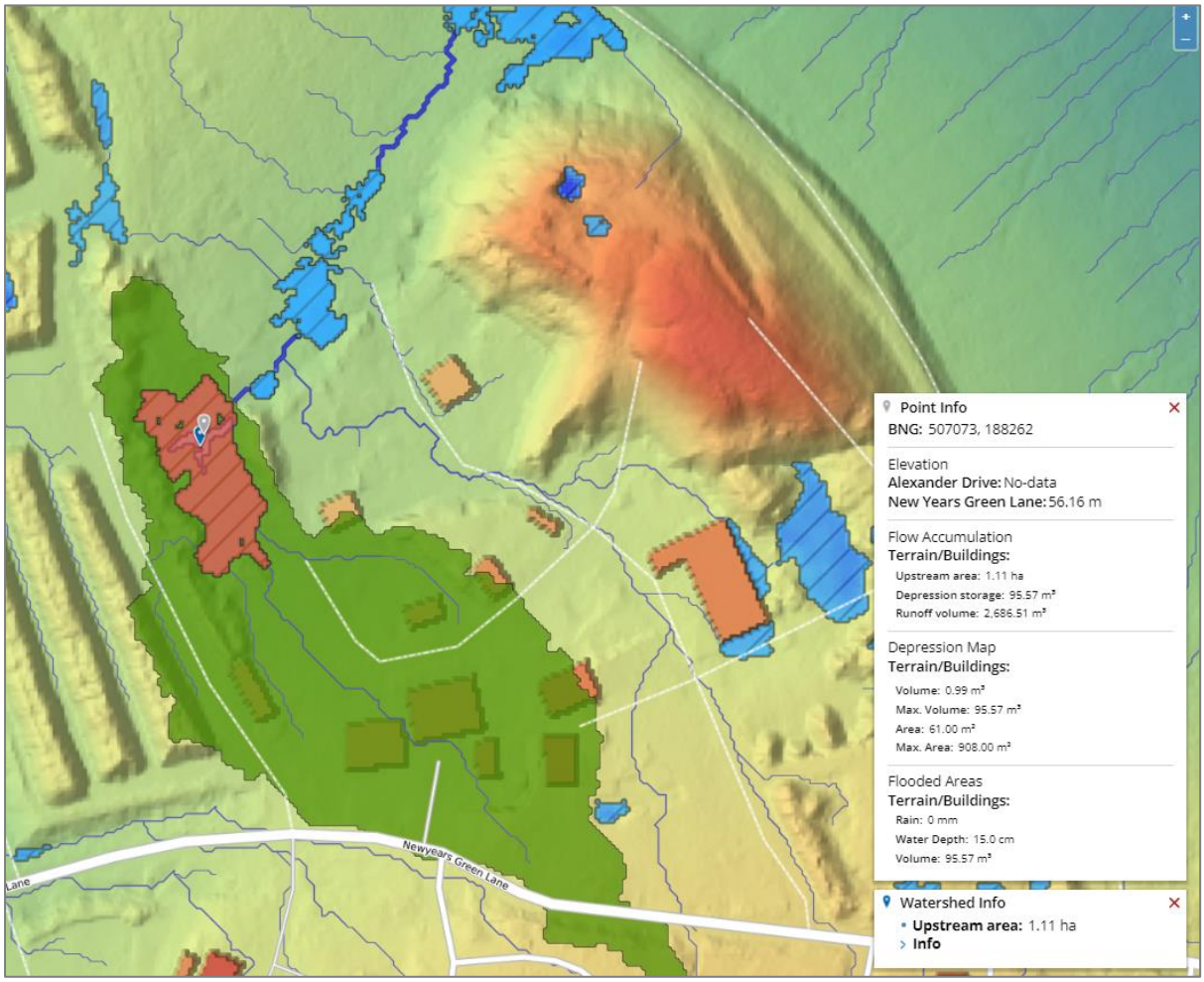

Figure 9 Catchment Eastern area

The proposed containment bund will prevent storm water run off from the site reaching the offsite area, thus, eliminating the risk of offsite flood risk. The CQA report considers all catchment areas on the development site, with consideration of the area cut from its natural flow path.

It should be noted that the majority of the catchment serving the depression originates offsite and the area incorporates a 400mm culvert, decreasing the risk of water building up. As shown in the profile section above, the flooded area does not affect the proposed

development and any flooding remains offsite. The maximum flooded depth in the depression is noted to be 15cm which can be considered low risk.

Therefore, no mitigation is required.

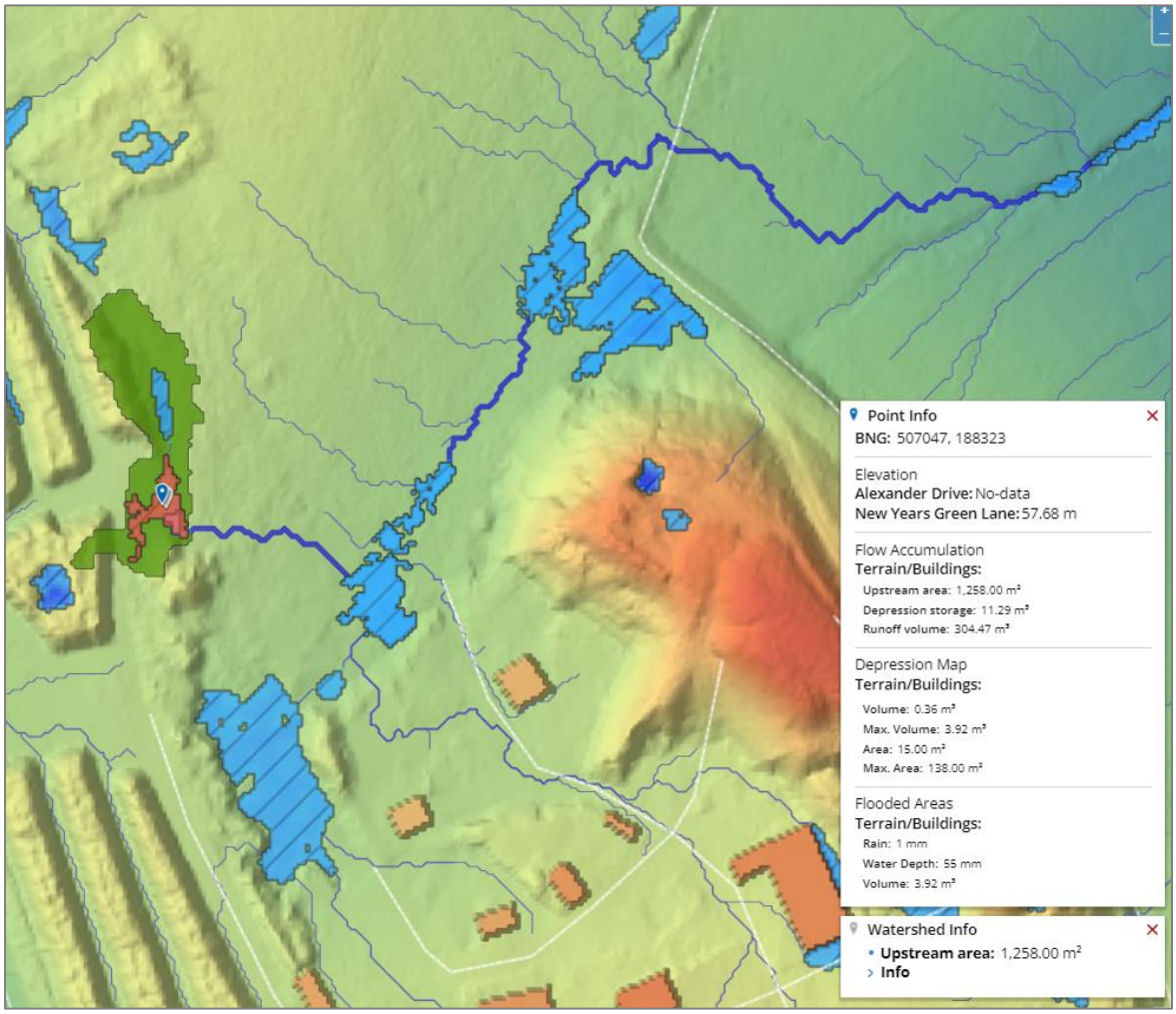

Figure 10 Catchment Northeastern area

The proposed containment bund within the site boundary will prevent site runoff from flowing onto adjacent areas . The catchment on site is limited, with the total catchment for the whole area (including offsite) being 1200m^2. The majority of the area is permeable beyond site with infiltration likely.

The maximum depth of runoff on site is 55mm which is considered to be low risk.

No mitigation is required as the containment report by CQA deals with all catchment originating onsite.

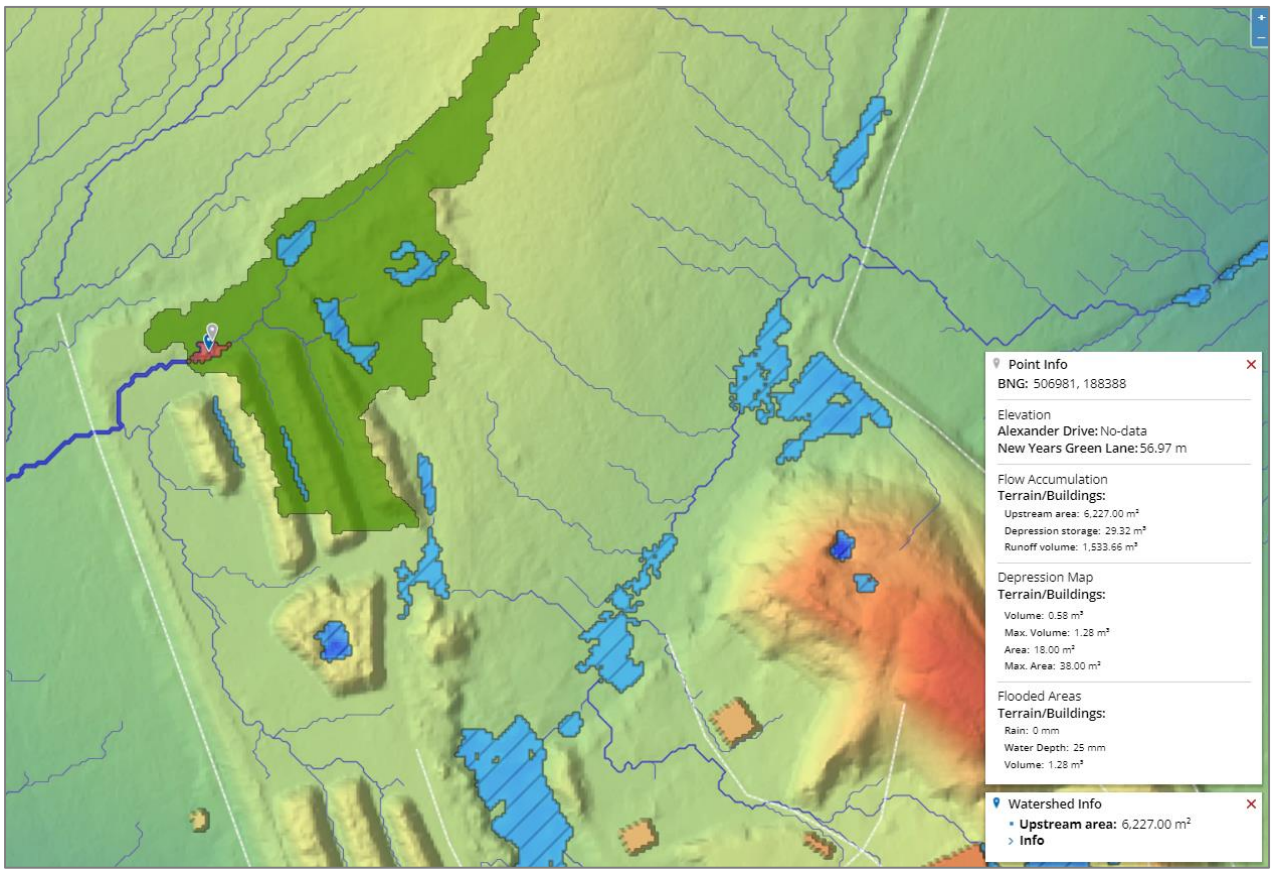

Figure 11 Catchment to the North

The catchment to the north crosses the development and generates a flow path. In line with the National Planning Policy Framework and EA directives, flow paths must be maintained. It should be noted that flooding is calculated at 25mm, which can be considered as low risk. However, the proposed bund wall for containment would cut the flow path. Therefore, mitigation is required to divert the flow path around the bund.

The catchment internal to the site has been considered in the CQA containment analysis and water arising on the development will be stored.

The required mitigation could consist a 300mm pipe within a filter drain to carry the flow path around the northern edge back to the existing egress. Alternatively, a 300mm deep 1m wide ditch could be taken around the northern boundary, based on the current depression profile. The route and design will need to be considered during detailed design. It is understood that the client owns the land on either side of the development.

2.3 Boundary Comments

In relation to comment 35, the site is going to be bunded to the specifications set out in the CQA Spill Mapping Report which includes bunds based on a risk assessment carried out using the CIRIA 736 methodology. This incorporates a kerb around the site as well as higher bunds in some areas depending on level and falls. Further details are available with the CQA Spill Mapping Report with drawings indicating the proposed bund heights.

3 SITE SURFACE WATER

enVar and CQA have detailed that all surface water arising on site with contained within site. The CQA Spill Mapping Report notes that 1397m3 of water can be retained on site within the bunds and 1000m3 further within the storage tanks. Environment Agency regulations do not permit untreated runoff leaving the development.

All compost treatment areas in the northern site are isolated from the main drainage network using a combination of barrier walls, bunding and isolated and sealed drainage systems. Attenuation storage is provided to ensure that all water can be contained within site.

enVar currently import water to serve their needs during the composting process, they are a net importer of water as surface water runoff currently stored on site is not sufficient for the composting process.

Water is stored in the surface water storage tanks or on the pad itself in the case of the credible worst-case event. When the surface water storage tanks reach 80% capacity, the water is collected and transported offsite by tanker to a suitably licenced facility for treatment and reuse at another facility or discharged under permit.

Comments 37 to 40

The comments 37 to 30 are shown below:

Sustainable drainage

37 The proposal is for permanent use of the existing composting facility on site, with no changes to the built footprint or impermeable areas. On this basis, the submitted drainage strategy summarises the existing drainage arrangements of the leachate containment system. The drainage strategy provides recommendations for bunding and containment of leachate runoff up to the 10-year event plus climate change. It is not however clear whether these recommendations have been incorporated into the scheme proposals. This should be clarified.

38 The submitted drainage strategy states that the parts of the site generating contaminated leachate runoff are kept separate to the parts of the site generating 'clean' runoff. The drainage strategy does not state how the 'clean' surface water runoff is managed. It is understood that the existing surface water drainage regime would not be altered as a result of the development, however, the drainage strategy should briefly outline the existing/proposed strategy for the 'clean' runoff.

39 The drainage strategy states that there are no significant site constraints to the use of SuDS, however, none are proposed/incorporated. It should be noted that lined SuDS could be incorporated regardless of the underlying geology. Where possible, the applicant should look to include above ground green SuDS to provide biodiversity, amenity, and water quality benefits. Rainwater harvesting should be incorporated where possible in line with the London Plan Policy SI13.

40 It should be noted that if the application involves altering the built footprint or impermeable areas in any way, then surface water runoff from these areas would need to be attenuated and restricted to the greenfield runoff rate (or as close as reasonably practicable) for the 100-year event plus 40% climate change, as per latest guidance/industry best practice. An assessment of exceedance flood flow routes above the design storm event should be provided. Written acceptance should be provided from the Environment Agency to confirm that sufficient mitigation has been incorporated to minimise the risk of pollution from the site.

Figure 12 Extract from Comments document

In relation to comment 37, the incorporation of the bunding at the heights specified within the CQA Spill Mapping Report is being undertaken by enVar.

Comment 38 notes the drainage of "clean" water runoff from site. However, it should be noted that all of the rain water which falls upon the site is collected for use in the process of recycling. To be clear there are no discharges of any water off of the site at all due to reuse in process works, as described above.

Comment 39 deals with drainage outfalls. All of the rain water which falls upon site is to be harvested. There is no off site drainage, infiltration or any other discharges. The site has successfully operated under such a mechanism for many years, the new bunding adds betterment to runoff capture and storage.

Comment 40 relates to storage of the 100 year event + 40% climate change event. The runoff can be stored on the site within the bunded area which can contain 1397m3 when constructed (as per the containment assessment modelling). In addition to the 1000m3 which can be contained in the tanks on site – total 2397m3. EPG have modelled the maximum volume of during the 100 year + 40% event (Appendix B) as 1570m3 (which can be contained). During a major storm event, the likelihood of a spill occurring at the same time as the event is low (see CQA Spill Mapping Report).

4 CONCLUSIONS

The Eastern flooding area noted within the Comment comments is outside of the site area and does not pose a risk to the development due to the presence of the culvert and the existing topography forming a bund.

Mitigation is required for the northern flow path, this can consist of a filter drain or trench around the northern edge leading back to the existing flow path egress from site.

Pluvial flooding on site can be considered low with the mitigation measures applied.

All runoff associated with the site will be reused, in the unlikely event that runoff storage exceeds 80%, water is collected and transported offsite. enVar are net importers of water due to the demand of water for the composting process.

The proposed site has the capacity to store the 1in100 year +40% storm event.

APPENDIX A:
Greater London Authority Planning Report

GREATER**LONDON**AUTHORITY

planning report 2021/0755/S1
23 August 2021

Highview Farm, New Years Green Lane, Harefield

in the London Borough of Hillingdon

planning application no.12579/APP/2021/2010

Strategic planning application stage 1 referral

Town & Country Planning Act 1990 (as amended); Greater London Authority Acts 1999 and 2007; Town & Country Planning (Mayor of London) Order 2008.

The proposal

Continued use of a composting facility operation up to 75,000 tonnes per annum of organic waste, including retrospective retention of two above ground leachate storage tanks and the installation of three freshwater storage tanks.

The applicant

The applicant is **West London Composting Ltd**, and the architect is **CQA International Ltd Consulting**.

Strategic issues

Land use principle: Waste recycling is an inappropriate use within Green Belt and the proposal does not meet the exception tests of the NPPF. The harm by reason of inappropriateness and any other harm is currently not clearly outweighed by other considerations so as to amount to the very special circumstances necessary to justify it. The applicant must therefore submit a more compelling very special circumstances case; including a rigorous alternative site search, undertake a thorough assessment of the harm to openness and any other harm, and provide a more robust visual impact analysis with acceptable impact mitigation measures. As it stands, the application does not comply with Policy G2 of the London Plan, and the NPPF(paragraphs 15-24).

Waste: Whilst the proposal would help support the waste policies of the London Plan, given that the application has not demonstrated a sufficiently strong very special circumstances case as set out above, the proposal does not fully comply with London Plan Policy SI8 (paragraphs 25-27).

Further work is needed related to **urban design**, **energy**, **circular economy, air quality**, **noise**, **biodiversity**, **sustainable development**, and **transport** (paragraphs 28-47).

Recommendation

That Hillingdon Council be advised that, the application does not currently comply with the London Plan, for the reasons set out in paragraph 52 of this report.

Context

1 On 8 July 2021 the Mayor of London received documents from Hillingdon Council notifying him of a planning application of potential strategic importance to develop the above site for the above uses. Under the provisions of The Town & Country Planning (Mayor of London) Order 2008 the Mayor has to provide the Council with a statement setting out whether he considers that the application complies with the London Plan, and his reasons for taking that view. The Mayor may also provide other comments. This report sets out information for the Mayor's use in deciding what decision to make.

2 The application is referable under the following Categories of the Schedule to the Order 2008:

- Category 3D: "*Development – (a) on land allocated as Green Belt or Metropolitan Open Land in the development plan, in proposals for such a plan, or in proposals for the alteration or replacement of such a plan; and (b) which would involve the construction of a building with a floor space of more than 1000 square metres or a material change in the use of such building."*
- Category 2B 1(b): *'Waste development to provide an installation with capacity for a throughput of more than—50,000 tonnes per annum of waste; produced outside the land in respect of which planning permission is sought', and*
- Category 2B.2: *'Waste development where the development occupies more than one hectare.'*

3 Once Hillingdon Council has resolved to determine the application, it is required to refer it back to the Mayor for his decision as to whether to direct refusal; take it over for his own determination; or allow the Council to determine it itself. The Mayor of London's statement on this case will be made available on the GLA website, www.london.gov.uk.

Site description

4 The application site is within Green Belt, has an area of 4.2 hectares and is split across two separate areas located to the north and south of New Years Green Lane. The site is 2.3 kilometres south east of Harefield, 1 kilometre north of Ickenham and 0.5 kilometres west of Ruislip. The majority of the northern site is bounded by open land, with 4 residential units to the south west and St Leonard's Farm to the south east of the site. The southern site is bounded by open land to south, east and west with Elm Tree Farm situated to the north east of the site.

5 Access to the site is via the eastern end of New Years Green Lane, which links to the A4180 to the east, which provides access to Rickmansworth to the north and the A40/M40 and M25 motorways to the south and the south west. The nearest section of Transport for London Road Network (TLRN) is the A40 Western Avenue, which lies 2.6 kilometres to the south of the site. The nearest section of the Strategic Road Network (SRN) is the A404 Rickmansworth Road located approximately 3.5 kilometres north of the site. Bus route 331 operates between Ruislip Station and Belmont Road; this can be accessed from Leaholme Way. West Ruislip Station, which is 2 kilometres to the east of the site, provides both a

Central line service between Epping and West Ruislip and mainline service to Marylebone and Gerrards Cross. The West London Composting Land site is estimated to have a public transport accessibility level (PTAL) of 2, on a scale of 1-6 where 6 is most accessible.

6 The existing compost maturation area is located on the northern side of the road (on Pylon Farm) and the waste reception (delivery) and in-vessel composting (IVC) facility is located on the southern side of the road (on Highview Farm).

7 The following structures occupy the application site:

- Weighbridge and site office;
- Maintenance building;
- Reception hall;
- Compost storage clamps;
- Water tanks;
- Final maturation and storage area;
- Car parking area;
- Drainage lagoon; and concrete hard standing

8 The River Colne flows 2.5 kilometres west of the application site in a north-south course. The Grand Union Canal also follows the same course as the River Colne. There are a number of Sites of Special Scientific Interest (SSSI) in the vicinity of this In-vessel composting (IVC) plant and operations. These include:

- Old Park Wood, which lies 3.6 kilometres to the north west;
- Harefield Pit, which lies 2.5 kilometres to the north west;
- Old Rectory Meadows, which lies 4 kilometres to the south west;
- Mid Colne Valley, which lies 2.1 kilometres to the west; and
- Ruislip Woods (Specifically Bayhurst Woods Country Park), which lies 200 metres to the north.

9 There are also a number of Local Nature Reserves in the vicinity including Northmoorhill Wood 3.4 kilometres to the west, Ruislip 3.4 kilometres to the east, Frays Valley and Denham Quarry Park 1.8 kilometres to the south west.

Details of the proposal

10 The detailed planning application is for the continuation and formalisation of existing recycling operations at land to the north and south of Newyears Green Lane for an In-Vessel Composting Facility (IVC) and maturation operation to handle a maximum throughput of 75,000 tonnes per annum (tpa) of organic waste on a permanent basis. Retrospective approval is also sought for amendments to the containment system at the OWC pad in the form of two above ground leachate storage tanks, as well as the separate installation of one freshwater storage tank at the OWC site and two freshwater storage tanks at the IVC site for use in an emergency situation.

Case history

11 The site has a long planning history. The most recent and relevant to this scheme is a planning permission that was granted on 17 September 2015 (LPA ref: 12579/APP/2012/2366) for the continuation and formalisation of existing recycling

operations at land to the North and South of New Years Green Lane for an In-Vessel Composting Facility (IVC) operation to handle a maximum throughput of 75,000 tonnes per annum of organic waste for a temporary period of five years. The application was supported by the previous Mayor: GLA ref: PDU/3052. However, this temporary approval expired in September 2020.

Strategic planning issues and relevant policies and guidance

12 For the purposes of Section 38(6) of the Planning and Compulsory Purchase Act 2004, the development plan in force for the area comprises the Hillingdon Local Plan:

Part 1 Strategic Policies (2012), the Local Plan Part 2 Development Management Policies (2020), and the Local Plan Part 2 Site Allocations and Designations (2020); and, the London Plan 2021.

13 The following are also relevant material considerations:

- The National Planning Policy Framework (2021);
- National Planning Practice Guidance; and
- West London Waste Plan 2015.

14 The relevant issues, corresponding strategic policies and guidance (supplementary planning guidance (SPG) and London Plan guidance (LPG)), are as follows:

- Green Belt - London Plan;
- Waste - London Plan; the Municipal Waste Management Strategy;
- Urban design - London Plan; Character and Context SPG;
- Sustainable development - London Plan; Mayor's Environment Strategy;
- Circular Economy - London Plan; GLA Guidance;
- Transport - London Plan; the Mayor's Transport Strategy;

Land use principle - Green Belt

15 The application site lies wholly within Green Belt land. London Plan Policy G2 seeks to protect Green Belt from inappropriate development in accordance with the National Planning Policy Framework (NPPF). Development proposals that would harm Green Belt should be refused except where very special circumstances exist.

16 Paragraph 149 of the NPPF sets out that the construction of new buildings on Green Belt should be regarded as inappropriate barring the limited exceptions to this:

a) buildings for agriculture and forestry;

b) the provision of appropriate facilities (in connection with the existing use of land or a change of use) for outdoor sport, outdoor recreation, cemeteries and burial grounds and allotments; as long as the facilities preserve the

openness of the Green Belt and do not conflict with the purposes of including land within it;

c) the extension or alteration of a building provided that it does not result in disproportionate additions over and above the size of the original building;

d) the replacement of a building, provided the new building is in the same use and not materially larger than the one it replaces;

e) limited infilling in villages;

f) limited affordable housing for local community needs under policies set out in the development plan; and

g) limited infilling or the partial or complete redevelopment of previously developed land, whether redundant or in continuing use (excluding temporary buildings), which would: - not have a greater impact on the openness of the Green Belt than the existing development; or - not cause substantial harm to the openness of the Green Belt, where the development would re-use previously developed land and contribute to meeting an identified affordable housing need within the area of the local planning authority.

17 The application is seeking full planning permission for the continuation and formalisation of existing recycling operations permanently at land to the north and south of Newyears Green Lane, within Green Belt, currently in temporary use.

18 The proposals do not meet any of the above exception tests, and therefore would be inappropriate development on the Green Belt which is harmful by definition and would not accord with Section 13 of the NPPF or London Plan Policy G2. Accordingly, it is necessary to demonstrate that very special circumstances exist in order for the development to be potentially acceptable.

19 Furthermore, the NPPF is clear at paragraph 148 that when considering applications on the Green Belt, substantial weight should be given to any harm to Green

Belt and that ‘very special circumstances’ will not exist unless the potential harm to the Green Belt by reason of inappropriateness, and any other harm resulting from the proposal, is clearly outweighed by other considerations.

20 The applicant has acknowledged that the proposed development would be inappropriate and does not meet any of the exception tests of the NPPF. The applicant has therefore set out very special circumstances that it contends would outweigh the harm to the Green Belt as follows:

- the facility provides a sustainable method of treating waste within the locality of arising which coincides with the objective of the London Plan and associated West London Waste Authority Plan.

- the site is an allocated waste management site in the West London Waste Plan.

- there is lack of alternative sites for the facility to be relocated and its loss from operation could mean the waste has to be treated outside of London.

- there is a clear advantage of maintaining a waste management site which has demonstrated its ability to process waste into a valuable product for a number of years.

- the ambition of UK government to meet national waste management targets, which composting will be key in assisting with.

21 The applicant has further stated that there is a clear economic and environmental advantage to locate composting sites near where the waste arises and this rural location within West London makes it an ideal location for composting. Finally, the applicant concludes that there will be no change to the site boundary and therefore no further curtailment of the Green Belt area.

GLA officer's assessment of the applicant's VSCs

22 The applicant's acknowledgement of the inappropriateness of the development within the Green Belt is noted. GLA officers have assessed the very special circumstances set out by the applicant.

23 Whilst the potential economic and other benefits of the development to the wider economy in West London are recognised, and notwithstanding the site's use as a temporary waste recycling facility which has resulted in the site being largely covered in built structures and hardstanding; the applicant has not demonstrated its claim that there is no alternative site by submitting an alternative sites search. Additionally, although the site is shown as an existing waste (compositing) site in Appendix 2 of the West London Waste Management Plan, the plan does not clearly state whether the use is temporary or permanent. Therefore, GLA officers do not accept that the applicant has demonstrated compelling reasons why the proposal cannot be located on a non-Green Belt site. Furthermore, the impact of a permanent compositing facility on nearby residents (particularly the four homes to the south west of the site), and the visual impact of the inappropriate development on Green Belt, could not be thoroughly assessed from the submitted documents and further information as set out elsewhere in this report is required to fully assess any potential adverse impacts of the proposal.

24 GLA officers therefore consider the harm by reason of inappropriateness and any other harm is currently not clearly outweighed by other considerations so as to amount to the very special circumstances necessary to justify it. The applicant must submit a more compelling very special circumstances case; including an alternative sites search, undertake a thorough assessment of the harm to openness and any other harm, and prepare and submit a robust visual impact analysis which considers shorter- and longerrange views (in both summer and winter), and any appropriate mitigation measures. The application does not currently comply with Policy G2 of the London Plan or the NPPF.

Waste

25 Policy SI8 of the London Plan states that the equivalent of 100 per cent of

London's waste should be managed within London (i.e. net self-sufficiency) by 2026. It also states that the waste management capacity of existing sites should be optimised. The views of the West London Waste Authority on the proposal should therefore be provided.

26 However, whilst the site's temporary compositing operations have made an important contribution to waste management in West London and helped fulfil the goals of the London Plan to manage 100% of the city's waste, London Plan Policy SI8 also confirms that location is one of the criteria that must be considered for development proposals for new waste sites or to increase the capacity of existing sites.

27 Given that the application has not demonstrated a sufficiently strong very special circumstances case as set out above, the proposal does not currently fully comply with London Plan Policy SI8.

Urban design

28 Chapter 3 of the London Plan sets out key urban design principles to guide development in London. Design policies in this chapter seek to ensure that development optimises site capacity; is of an appropriate form and scale; responds to local character; achieves the highest standards of architecture, sustainability and inclusive design; enhances the public realm; provides for green infrastructure; and respects the historic environment.

29 No changes are proposed to the built form, external appearance of the site's buildings and facilities; however, as set out above, a more rigorous visual impact analysis has been requested which will be reviewed by GLA officers upon receipt.

Sustainable development

Air quality

30 London Plan Policy SI1 states that to tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed: 1) Development proposals should not: a) lead to further deterioration of existing poor air quality b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits, and c) create unacceptable risk of high levels of exposure to poor air quality.

31 Although it is noted that the Environment Agency (EA) has already assessed and approved operations at the site of up to 75,000 tpa through an Environmental Permit, the site's air quality impact of the recycling operations must still be assessed in strategic planning terms. Therefore, the applicant must submit a policy-compliant air quality assessment report prior to any Stage 2 referral.

Biodiversity

32 The site lies in close proximity to numerous Sites of Importance for Nature Conservation (SINC). London Plan Policy G6 states that Sites of Importance for Nature Conservation should be protected, and the applicant should therefore provide a detailed

assessment on this, including mitigation measures if there would be any harm caused by the proposals.

33 Policy G6 also requires development proposals to aim to secure net biodiversity gain. The applicant is therefore required to provide evidence that the proposed development would secure a net biodiversity gain in accordance with Policy G6 D.

Flooding and drainage

Flooding

34 The site is in Flood Zone 1 and is greater than 1 hectare in area. A Flood Risk Assessment (FRA) has been submitted as required under the National Planning Policy Framework (NPPF). The Environment Agency Flood Risk from Surface Water mapping shows an area of 'high risk' pluvial flooding to the east of the northern site boundary. In the design 'medium risk' scenario, predicted flood depths are up to 900mm.

35 The 'existing surface water management system on northern site' Figure 8 in the FRA shows that there is no kerb edge to the tarmac pad along the eastern site boundary. There could therefore be a risk of surface water encroaching within the site from this area identified at high risk of pluvial ponding. Figure 10 in the FRA shows that a kerb is recommended along the eastern edge of the site, however, it is not certain whether this recommendation has been incorporated into the scheme. Therefore, the FRA should include additional assessment of the topography in the area to ascertain the risk of pluvial flooding encroaching within the site. Further commitment to incorporate the kerb along the eastern site boundary should be provided, as well as confirmation that the proposed level of the kerb provides adequate protection. The FRA adequately assesses the risk of flooding from fluvial/tidal, sewer, groundwater, and reservoir flooding, which is considered to be low.

36 The FRA provided for the proposed development does not comply with London Plan Policy SI12, as it does not give appropriate regard to the risk of pluvial flooding from the east of the northern site. Further assessment of levels should be provided to quantify the risk and inclusion of appropriate mitigation measures should be confirmed.

Sustainable drainage

37 The proposal is for permanent use of the existing composting facility on site, with no changes to the built footprint or impermeable areas. On this basis, the submitted drainage strategy summarises the existing drainage arrangements of the leachate containment system. The drainage strategy provides recommendations for bunding and containment of leachate runoff up to the 10-year event plus climate change. It is not however clear whether these recommendations have been incorporated into the scheme proposals. This should be clarified.

38 The submitted drainage strategy states that the parts of the site generating contaminated leachate runoff are kept separate to the parts of the site generating

‘clean’ runoff. The drainage strategy does not state how the ‘clean’ surface water runoff is managed. It is understood that the existing surface water drainage regime would not be altered as a result of the development, however, the drainage strategy should briefly outline the existing/proposed strategy for the ‘clean’ runoff.

39 The drainage strategy states that there are no significant site constraints to the use of SuDS, however, none are proposed/incorporated. It should be noted that lined SuDS could be incorporated regardless of the underlying geology. Where possible, the applicant should look to include above ground green SuDS to provide biodiversity, amenity, and water quality benefits. Rainwater harvesting should be incorporated where possible in line with the London Plan Policy SI13.

40 It should be noted that if the application involves altering the built footprint or impermeable areas in any way, then surface water runoff from these areas would need to be attenuated and restricted to the greenfield runoff rate (or as close as reasonably practicable) for the 100-year event plus 40% climate change, as per latest guidance/industry best practice. An assessment of exceedance flood flow routes above the design storm event should be provided. Written acceptance should be provided from the Environment Agency to confirm that sufficient mitigation has been incorporated to minimise the risk of pollution from the site.

41 The nature of the existing/proposed site means that surface water drainage requirements are not directly relevant to London Plan Policy SI13. The drainage strategy for the proposed development generally complies, however, further commitment to incorporate the recommended bunding is required to demonstrate that the attenuation volume can be retained within the site. Further information should be provided as to the existing/proposed surface water drainage regime for the ‘clean’ runoff generated from the site. SuDS should be incorporated where possible, including rainwater harvesting. An assessment of exceedance flood flow routes above the design flood event should be provided.

Water efficiency

42 The proposed development does not comprise new buildings or built footprint. Therefore, the water efficiency targets of London Plan are not applicable.

Energy

43 There are no heated buildings in this application however, it is noted that there are some energy uses on-site e.g. transporting and turning compost. The applicant should briefly outline the main energy uses on site and should confirm that these are served via energy efficient methods. The applicant should also consider the opportunities to serve energy uses via renewable energy sources.

Circular Economy

44 London Plan Policy SI7 requires development applications that are referable to the Mayor of London to submit a Circular Economy Statement, whilst London Plan Policy D3 requires development proposals to integrate circular economy principles as part of the design process. Therefore, the applicant is required to submit a Circular Economy Statement in accordance with GLA guidance.

Transport

45 The site is located on New Years Green Lane, which is not part of or in close proximity to either the TLRN or SRN. Therefore, in light of its location, scale and nature, TfL is satisfied that the proposed development is unlikely to impede vehicle movements on these networks.

46 A construction logistics plan (CLP) and a delivery and servicing plan (DSP) should be submitted for approval by Hillingdon Council and secured by condition. Although not required for the scale of the development, it is suggested that a travel plan is devised, and additional cycle parking is provided on site to encourage sustainable travel.

47 In summary, the proposal does not raise strategic transport concerns.

Local planning authority's position

48 The Council's officers are currently assessing the application, a committee date has not been determined.

Legal considerations

49 Under the arrangements set out in Article 4 of the Town and Country Planning (Mayor of London) Order 2008 the Mayor is required to provide the local planning authority with a statement setting out whether he considers that the application complies with the London Plan, and his reasons for taking that view. Unless notified otherwise by the Mayor, the Council must consult the Mayor again under Article 5 of the Order if it subsequently resolves to make a draft decision on the application, in order that the Mayor may decide whether to allow the draft decision to proceed unchanged, or direct the Council under Article 6 of the Order to refuse the application, or issue a direction under Article 7 of the Order that he is to act as the local planning authority for the purpose of determining the application and any connected application.

50 There is no obligation at this present stage for the Mayor to indicate his intentions regarding a possible direction, and no such decision should be inferred from the Mayor's statement and comments. Article 6 or 7 directions are considered against the requirements of the 2008 Order and are not made at the request of the applicant or any other party.

Financial considerations

51 There are no financial considerations at this stage.

Conclusion

52 London Plan policies on Land use principle, Green Belt, waste, circular economy, noise and air quality, sustainable development, and transport are relevant to this application. The application does not currently comply with the London Plan, but the following matters should be addressed to ensure full compliance with the London Plan:

- **Land use principle**: Waste recycling is an inappropriate use within Green Belt and the proposal does not meet the exception tests of the NPPF. The harm by reason of inappropriateness and any other harm is currently not clearly outweighed by other considerations so as to amount to the very special circumstances necessary to justify it. The applicant must therefore submit a more compelling very special circumstances case; including a rigorous alternative site search, undertake a thorough assessment of the harm to openness and any other harm, and provide a more robust visual impact analysis with acceptable impact mitigation measures. As it stands, the application does not comply with Policy G2 of the London Plan, and the NPPF.

- **Waste**: Whilst the proposal would help support the waste policies of the London Plan, given that the application has not demonstrated a sufficiently

strong very special circumstances case as set out above, the proposal does not fully comply with London Plan Policy SI8.

page

- **Urban design**: No changes are proposed to the built form, external appearance of the site's buildings and facilities; however, as set out above, a more rigorous visual impact analysis has been requested which will be reviewed by GLA officers upon receipt.
- **Circular economy**: The applicant is required to submit a Circular Economy Statement in accordance with GLA guidance.
- **Air quality**: There are strategic concerns and the applicant must submit policycompliant air quality assessment report prior to any Stage 2 referral application.
- **Sustainable development**: Further information is required.
- **Biodiversity**: The applicant is required to provide mitigation measures against harm and evidence that the proposed development secures a net biodiversity gain.
- **Transport**: A construction logistics plan (CLP) and a delivery and servicing plan (DSP) should be submitted for approval by Hillingdon Council and secured by condition. TfL also suggests that a travel plan is devised, and additional cycle parking is provided on site to encourage sustainable travel.

For further information, contact GLA Planning Team:

Tefera Tibebe, Strategic Planner, Case Officer – Development Management
tefera.tibebe@london.gov.uk
Lyndon Fothergill, Team Leader – Development Management
lyndon.fothergill@london.gov.uk
Allison Flight, Deputy Head of Development Management
alison.flight@london.gov.uk
John Finlayson, Head of Development Management
john.finlayson@london.gov.uk
Lucinda Turner, Assistant Director of Planning lucinda.turner@london.gov.uk

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APPENDIX B:
1in100+40% Storage Volume Calculation

Project: Uxbridge Volume

Client: enVar

Location: London

Catchment Details:
1in100+40% Vol

Buildings		m² x 95 %
Dense surfacing	14000	m² x 90 %
Effective Area	12600	m²

Storage Details:

Length	10000 m
Bed Slope	Horizontal
Width	1 m
Crossfall	None
Depth	0.15 m
Porosity	100 %
Slope Efficiency	100 %

Rainfall Details - FSR Method:

Return Period	100 years
Climate Change Factor	40 %
r value	0.44
M5-60	20.7 mm

Summer Storm Profile

Duration	Intensity mm	mm/h	Required storage(m³)
30 min	47.9	95.7	602.772
45 min	54.2	72.3	682.794
60 min	58.7	58.7	739.685
2 hours	69.7	34.8	876.663
6 hours	86.8	14.5	1090.917
24 hours	112.1	4.7	1399.328

Outflow Details:

Infiltration rate	7E-05 m/hr

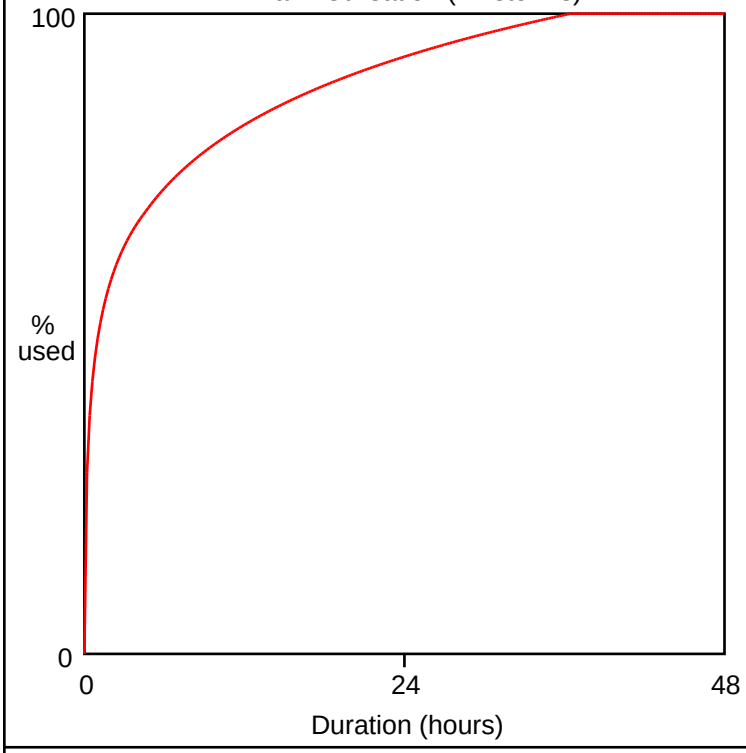
Infiltration by CIRIA 3D method

Safety Factor against flooding = 1.5

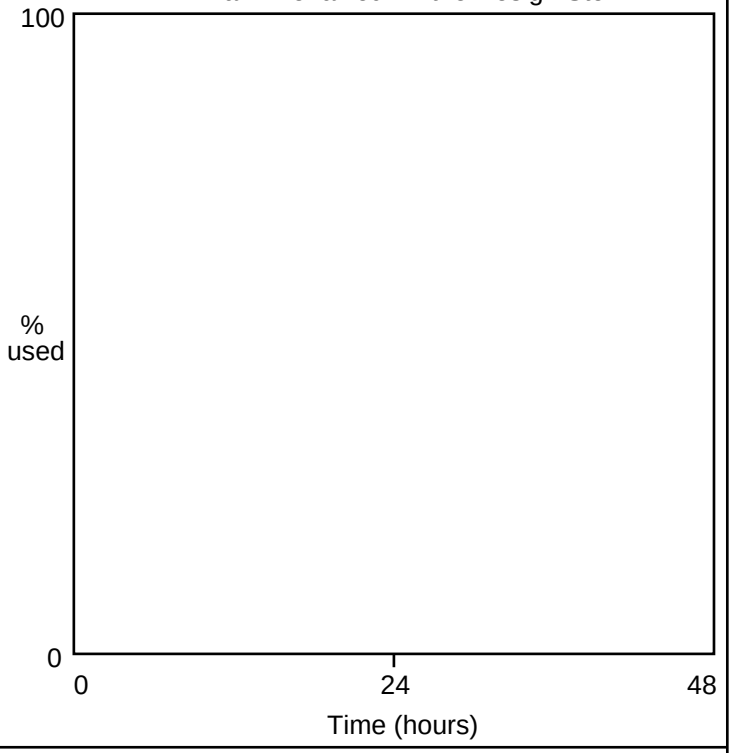
Results:

Outcome	Fail
Critical Storm Duration	over 48h
Critical Rainfall Rate	0 mm/h
Hmax	0.157 m
Time to half empty	1361.8 hrs
Volume Required	1570.000 m³

Tank Utilisation (All storms)



Tank Behaviour In the Design Storm



Company:

Appendix K

CQA Spill Mapping Report

CQA INTERNATIONAL LIMITED

West London Composting Ltd

Newyears Green Lane, Harefield, Uxbridge UB9 6LX

Spill Mapping Assessment & Containment System Capacity Modelling

Report prepared for

Name of client: West London Composting Ltd

Date: 17 March 2021

ISO 9001
Certificate No. GB2005673

Environmental Engineers

CQA INTERNATIONAL LIMITED

The Keele Centre, Three Mile Lane, Keele, ST5 5HH, UK
Phone: +44 (0)1782 338979, Web: www.cqainternational.co.uk

Quality management data

Name of Project	West London Composting Ltd
CQA Reference No.	30408
Client details	West London Composting Ltd Newyears Green Lane, Harefield, Uxbridge UB9 6LX
Client Reference No.	
Type of document	Report
Title of this document	Spill Mapping Assessment & Containment System Capacity Modelling
Status / Version	Final
Issue date and history	Draft version reviewed: 3 March 2021 Final version issued: 17 March 2021
Prepared by	Martin Avery & Darren Bland
Reviewed by	Robert Stevens & Peter Stevens
Authorised to be issued as a formal report from CQA International Ltd by (name, position)	Darren Bland (Director)
Signature	

Spill Mapping Assessment & Containment System Capacity Modelling

Project Reference: 30408

17 March 2021

Executive Summary

CQA International Ltd (CQAI) was appointed by West London Composting Ltd (WLC). The Site referred to in this report is located in Harefield, Middlesex and processes organic green waste through in-vessel and open windrow composting. The Site comprises two areas, (northern Site and southern Site) separated by a public road. These areas have been treated separately.

This report presents the results of spill mapping assessment and containment system capacity modelling for the Site.

This assessment provides a justifiable basis on which the Site can determine secondary containment improvement works to meet regulatory and planning authority requirements compliant to relevant industry best practice guidance (CIRIA C736, 2014).

The containment capacity modelling exercise assesses the Site in the existing configuration and presents probabilities of occurrence for both independent and simultaneous events. Potential scenarios include fire, loss of inventory from tank failure and a storm rainfall event. A risk assessment was used to evaluate the probability of each scenario for both individual and combined events to determine a credible worst case scenario event.

Spill mapping was conducted to assess flow paths on site and the containment system capacity modelling exercise represents the extent of a credible worst-case scenario event with conceptual modifications in place. This will enable detailed design to be produced and construction/remedial works undertaken.

The assessment demonstrates that under normal operating and climatic conditions the Sites provide an amount of containment, however this is less than that required for a credible worst-case scenario.

The modelling presents elevations required for infrastructure to provide the required containment for a credible worst-case scenario event. The design of the infrastructure modifications is required to meet CIRIA C736 and it is recommended that construction quality assurance is conducted during the works.

Contents

Tables

Figures

Appendices

1. Introduction

1.1 Terms of Reference

CQA International Ltd (CQAI) was appointed by West London Composting Ltd. The Site referred to in this report is located in Harefield, Middlesex and processes organic green waste through in-vessel and open windrow composting. The Site comprises two areas, (north and south) separated by a public road. These areas have been treated separately.

CQAI undertook a technical study to determine the required capacity of the secondary containment at the Site. Measures are recommended to achieve compliance with relevant guidelines.

1.2 Scope of Report

The report considers findings from a site walk over and a topographic survey.

The spill mapping assessment uses the topographic survey data to determine whether the current topography and built environment provides the necessary flow paths and sufficient secondary containment capacity.

This report comprises:

- Summary of the administrative background
- An overview of the site details and characteristics.
- Summary of site operating procedures for containment.
- Details of the input data used for the assessment.
- A determination of current secondary containment capacity (spill mapping assessment).
- Key recommendations including proposed conceptual measures to achieve compliance with industry guidelines (containment system capacity modelling).

This assessment was carried out in compliance with industry best practice as defined by CIRIA Report C736 (Containment systems for the prevention of pollution, secondary, tertiary and other measures for industrial and commercial premises, 2014) which is widely accepted

by the Environment Agency (EA) and planning authorities as the relevant guidance document for bio-waste permit holders.

The assessment will assist the operator with the following:

- Support a planning application made by WLC to Hillingdon Council for permanent residency of the land to the North and South of Newyears Green Lane (the site) for the continued use of an organic composting facility operation to handle a maximum throughput of up to 75,000 tonnes per annum of organic waste.
- Support an application by WLC to discharge some historic outstanding planning conditions
- Respond to a "notice of variation and consolidation" issued by the Environment Agency (EA). This report will also assist WLC to respond to a Regulation 61 (Schedule 1) notice, issued by the EA.

It is understood that a programme of facility upgrade works to include the site secondary containment system is to be conducted at the Site.

The recommendations provided herein are intended to be used as a framework for discussion and agreement with the regulatory authorities prior to undertaking any further investigation, (re)design and construction works required to meet industry best practice regulations.

2. Administrative Background

2.1 New Planning Application

This document supports a planning application made by WLC to Hillingdon Council for permanent residency of the land to the North and South of Newyears Green Lane (the site) for the continued use of an organic composting facility operation permitted for a maximum throughput of 75,000 tonnes per annum of organic waste.'

2.2 Planning Conditions

The grant of planning permission (Application Ref: 12579/APP/2012/2366) was issued by the council of the London Borough of Hillingdon on 17 September 2015 and subjected to a schedule of conditions. This report provides information to support the discharge of condition 15 (points 3 & 4) and condition 18, as reproduced in Table 1.

Table 1 Planning condition requirements	
Condition	Requirement
15	The development (the increased tonnage) hereby permitted shall not be commenced until a Hydrogeological Risk Assessment (HRA) for the activity on site must be submitted to and approved in writing by the Local Planning Authority. The findings of this assessment shall be implemented as approved. The HRA will include: 1) The collection of relevant site specific data to characterise the aquifer and local geological conditions. 2) A Detailed Quantitative Risk Assessment (DQRA) which will consider the risk the operation and current management techniques pose to groundwater should be produced, based on the findings of part 1). 3) Based on the risks identified in part 2), a review of available mitigation measures should be undertaken and following interpretation of the DQRA and the available mitigation measures, proposals to minimise risks to groundwater should be undertaken and justified. 4) Recommendations and findings of part 3 should be provided in the HRA. REASON (i) The site is located above a principal aquifer and within 50 days' travel time of the public abstraction (SPZ1) at Ickenham. This abstraction point is a very sensitive

Table 1	Planning condition requirements
Condition	Requirement
	receptor and requires a high level of protection to conserve water resources to provide public drinking water in the area. (ii) Ongoing development and intensification of this site poses a significant risk to groundwater. The application as submitted fails to give adequate assurances that the risks the activity poses to groundwater are fully understood or that the sensitivity of the environmental setting has been appropriately considered. A more in depth assessment is therefore required to assess the risk at this site. (iii) To comply with Policies 0E7 and 0E8 of the Hillingdon Local Plan: Part 2- Saved UDP Policies (November2012) and Policy 5.14 of the London Plan (2015).
18	The development permitted by this planning permission shall be carried out in accordance with the approved Flood Risk Assessment (ERA) SLR Ref: 416.00996.00006 August 2012 and the following mitigation measures detailed within the FRA: Limiting the surface water run-off generated by the 1 in 100 year plus climate change critical storm so that it will not exceed the run-off from the undeveloped site and not increase the risk of flooding off-site. The mitigation measures shall be fully implemented prior to occupation and subsequently in accordance with the timing/phasing arrangements embodied within the scheme, or within any other period as may subsequently be agreed, in writing, by the Local Planning Authority. REASON To prevent flooding by ensuring the satisfactory storage of/disposal of surface water from the site, in compliance with Policies 0E7 and OE8 of the Hillingdon Local Plan: Part 2 - Saved UDP Policies (November 2012) and Policy 5.14 of the London Plan (2015)

2.3 Pre-Operational Measures

A "notice of variation and consolidation" (Ref: EPR/UP3893EC/V007), issued by the EA on 28 June 2019, requires specific pre-operational measures to be implemented. This report addressed measure № 3, as reproduced in Table 2.

Table 2	Pre-operational measures requirement
Reference	Pre-operational measures
3	At least 8 weeks (or any other date as agreed with the Environment Agency) prior to the commencement of the open windrow composting activity (Activity reference AR1, Table S1.1B), the operator shall ensure that a review of the design, method of

Table 2	Pre-operational measures requirement
Reference	Pre-operational measures
	construction and integrity of the proposed north site secondary containment is carried out by a qualified civil or structural engineer. The review shall compare the constructed secondary containment against the standards set out in How to comply with your environmental permit. Additional technical guidance for: composting and aerobic treatment sector (LIT 8705 Report version 1.0) and CIRIA C736 – Containment Systems for the Prevention of Pollution – secondary, tertiary and other measures for industrial and commercial premises or other relevant industry standard. The review shall include: physical condition of the secondary containment the suitability for containment when subjected to the dynamic and static loads caused by catastrophic tank failure; any work required to ensure compliance with the standards set out in CIRIA C736 or other relevant industry standard; and a preventative maintenance and inspection regime A written report of the review shall be submitted to the Environment Agency for approval detailing the review's findings and recommendations. Remedial action shall be taken to ensure that the secondary containment meets the standards set out in the guidance documents and implement the maintenance and inspection regime. The new open windrow composting activity shall not commence at the facility unless the Environment Agency has given prior written permission under this condition

2.4 Regulation 61(1) Notice

The EA is required by primary legislation to review all permits for bio-waste treatment facilities and ensure the implementation of best available techniques (BAT) at these installations. The objectives are to reduce the possibility and impact of emissions, prevent pollution and reduce inappropriate use of resources. The notices are issued centrally, rather from local offices. All current installation permits will be varied (with charges, expected to be at the normal variation rate) and will include a date from which compliance with the identified BAT measures and any other permit conditions must be met.

While it is not understood that WLC has been issued with a Regulation 61 (1) notice, this assessment and modelling exercise will be useful in reference to Section 1, Parts 'e to h' of the Regulation 61(1) Notice, as follows:

e. *"Where your activity has above ground storage or primary containment, describe any secondary containment and whether it currently meets the relevant standard in the "Containment systems for the prevention of pollution (C736)" report*
f. *Where your activity has storage, lagoons describe how the construction of the lagoons meet CIRIA 759 report*
g. *Further to "point e, where you have concluded that secondary containment is not required or does not need to meet the standards in the C736 report, explain why the current design and construction is fit for purpose, and enable a baseline standard so as to establish a quantified comparison.*
h. *Confirm if storage lagoons are covered to prevent emission loss.*

This assessment and modelling exercise will assist the regulator in assessing how easily you (the operator) will be able to meet new requirements and the kind of permit variation that will be required for your installation."

3. Technical Data

3.1 Site Location

The site is located approximately 2.5km West of Ruislip, Hillingdon at National Grid Reference TQ 07112 88158, as shown on Figure 1. It is accessed from Newyears Green Lane which runs between the north and south site. The surrounding land use is primarily agricultural and industrial.

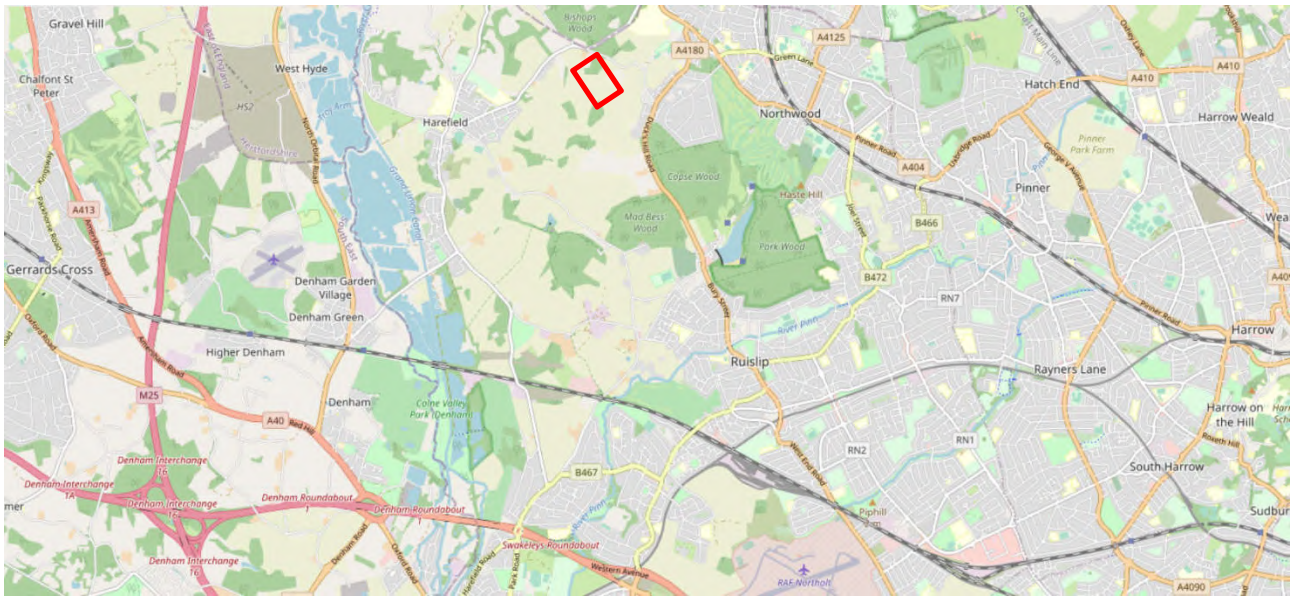


Figure 1 Site location (Copyright: OpenStreetMap)

3.2 Site Layout

The northern and southern Sites are shown on Figure 2.

Waste delivery and initial processing is undertaken in the reception building, located in the southern area. Incoming feedstock is screened and placed into composting vessels located to the south and east of the reception building. The southern site also incorporates car parking and storage areas.

Following the in-vessel composting, material is transferred to the northern area to undergo maturation. The Site comprises an open windrow composting pad and leachate storage tanks. Final screening and storage of the finished compost takes place here before material is shipped-out as product.

Figure 2 Site layout (Copyright: Google Earth)

3.3 Site-Specific Data

A topographic survey was organised by CQAI and the results are summarised on Drawing 30408/WLC/SM/01 (see Appendix A). This survey represents the area addressed in this study.

The topographic data were used to compile a Digital Elevation Model (DEM) of the facility, for use in the capacity calculations.

CQAI also carried out a walk-over reconnaissance to provide ground truth and additional observations to support the assessment.

3.4 Documentary Data

CQAI prepared a detailed assessment of the suitability of the existing containment system as a separate study in 2019. The report describes the inspections carried out and the data reviewed. Recommendations in this report may need to be implemented in conjunction with recommendations in this report in order to achieve the required objectives.

The Fire Prevention Plan (FPP) for the facility was updated in 2019 in line with EA guidance. This document was prepared by WRM Ltd on behalf of WLC.

3.5 Definition of Containment Systems

The definition of containment systems assessed and modelled during the works are defined below:

Primary Containment (i.e. storage) is the most important means of preventing major incidents involving loss of inventory. It is achieved by the equipment used to store or transfer it, such as storage tanks, intermediate bulk containers (IBCs), drums, pipework, valves, pumps and associated management and control systems. It also includes equipment that prevents the loss of primary containment under abnormal conditions, e.g. high-level alarms linked to shut-down systems.

Secondary Containment minimises the consequences of a failure of the primary storage by preventing the uncontrolled spread of the inventory. Secondary containment is achieved by equipment that is external to and structurally independent of the primary storage, for example concrete or earth bunds around storage tanks, or the walls of a warehouse storing drums. Secondary containment may also provide storage capacity for firefighting and cooling water.

Tertiary Containment (or remote containment) includes anything beyond secondary containment, possibly also an allowance for firefighting water should this not be included in the secondary containment storage volume. Tertiary containment is, however, also a line of defence for failure of secondary containment and should only be used in extreme emergency events, and not as part of daily operations.

4. Containment Capacity Modelling

4.1 Requirement

The modelling exercise will support a planning application, support an application to discharge historic planning conditions and confirm compliance to the Regulator.

4.2 Approach

CIRIA C736 suggests that the secondary containment system should be capable of containing:

- the total volume of inventory that could be released during a credible incident
- the maximum rainfall that would be likely to accumulate within the containment before, during and/or after an incident
- firefighting agents (water and/or foam), including cooling water

The secondary containment systems are understood to have been designed to cope with day-to-day routine/normal operations.

It is important that a credible "worst-case" scenario is defined to ensure that the assessment is realistic. CIRIA C736 states:

> *In determining containment requirements, the volume of substance should be based on the loss from a credible scenario and this need not necessarily involve the entire site inventory. This should be discussed and agreed with regulators.*

4.3 Definition of Scenarios

The quantification of scenarios, as defined in CIRIA C736 (2014), is based on the approaches in Table 3.

Table 3 Credible worst-case scenarios	
Item	Definition
Inventory	Containment volumes would normally be based upon the '110 per cent' and '25 per cent' rules as per requirements of C736. i.e., *"Where two or more tanks are installed within the same bund, the recommended capacity of the bund is the greater of:*

Table 3	Credible worst-case scenarios
	110 per cent of the capacity of the largest tank within the bund or *25 per cent of the total capacity of all of the tanks within the bund, except where tanks are hydraulically linked in which case they should be treated as if they were a single tank".* Tank dimensions and storage capacity are produced from measurements taken on site during the survey stage and therefore may differ from volumes presented in other documentation.
Firefighting water	Water volumes which may be produced during firefighting are based on the predictions in the FPP in line with guidance produced by the EA.
Rainfall	Runoff from a 24-hour duration event with an annual exceedance probability (AEP) of 10%, i.e., a 1 in 10-year event. The depth-duration-frequency rainfall model contained in the Flood Estimation Handbook (FEH) web service was used for this calculation. A 10% climate change adjustment was included, in accordance with UK Government guidance. Output from the FEH Web Service is presented in Appendix A.

4.4 Spill Mapping Assessment

The Spill Mapping Assessment uses the DEM derived from the topographic survey to identify surface water catchments, flow paths and to assess whether all relevant flow paths are contained by the containment systems.

This assessment determines the extent and area of the secondary containment and its capacity. The capacity is herein defined as the 'volume of liquid that would be retained before a breach of the tertiary containment system occurs'.

The capacity of the secondary containment system is compared to the volume of liquid that would arise from a range of scenarios.

4.5 Containment System Capacity Modelling

In the event of the current secondary containment capacity being deemed insufficient, further modelling will be required to determine options to achieve the additional capacity. This may involve modifications to the infrastructure, such as installing walls, bunds or lagoon/tank storage. These engineering solutions should be integrated without significant disruption to the Site following agreement with the regulator.

5. Flood Scenario Quantification

5.1 Northern Site

5.1.1 Inventory

Three tanks are located to the north of the Site. Two tanks store leachate (surface water runoff from the storage pad), collected via an open surface water channel and pumped sump. The third tank stores clean water for firefighting.

The stored inventory has a combined volume of 991m^3. A conservative assumption for the scenario is that both tanks would be full to operational freeboard level and have no surplus capacity. Tank inventory is calculated using tank capacity.

Tanks may fail by developing leaks. The tanks at this Site are expected to have a remaining service life of at least 15 years (assumed service life from new of 20 years). A conservative assessment would be that a leak may occur once during the service life, and that the probability of this occurring on any one day is uniform. This implies a probability on any one day of 1.37x10^{-4}.

Total inventory loss would require catastrophic tank failure which is possible due to tank deterioration. However, this may occur due to vehicle impact, pipe connection failure or other damage. Such events are difficult to quantify.

Due to the volume available for tertiary containment greatly exceeding the 110% and 25% rules for the stored inventory, this is not used in calculations.

5.1.2 Rainfall

The rainfall event, as defined in Table 3, was determined to be 56.94mm which, on a catchment area of 14,480m^2, would therefore produce a surface water runoff volume of 907m^3. The probability of this event, as defined in the guidelines, is 2.74x10^{-4}.

5.1.3 Firefighting and Cooling Water

Firefighting water requirements were calculated from EA guidance. This was greater than the volume quoted in the FPP. EA guidance suggests that a 300m^3 compost pile would require 2000l/min of water for 180min (i.e. 360m^3 of water). On this basis, for a maximum compost pile size of 750m^3, the required firefighting water is 900m^3.

The probability of a fire in a compost pile is estimated from reported cases. An internet search found five major incidents on managed facilities in the last ten years. The number of smaller fires is likely to be greater. Conservatively, the assessment assumed 2 incidents per

year. The average number of composting facilities during this period is estimated to be 150 (lower than likely, therefore increasing probability). This results in a probability of a fire occurring on any one day of $3.65x10^{-5}$.

5.2 Southern Area

5.2.1 Inventory

Four leachate tanks are located on the southern Site. There are 5 rainwater storage tanks, 3 located within the contained area and 2 larger tanks near western boundary, both of which fall outside of the secondary containment area. Their volumes are excluded from this study.

The stored inventory has a combined volume of $306m^3$. A conservative assumption for the scenario is that all tanks would be full to operational freeboard level and have no surplus capacity.

Tanks may fail by developing leaks. The tanks have been in service since the development of the southern area in approximately 2008, so the remaining service life is reduced to 5 years conservatively (assumed service life from new of 20 years). A conservative assessment would be that a leak may occur once during the service life, and that the probability of this occurring on any one day is uniform. This implies a probability on any one day of $1.37x10^{-4}$.

Total inventory loss would require catastrophic tank failure which is possible due to tank deterioration. However, this may occur due to vehicle impact, pipe connection failure or other damage. Such events are difficult to quantify.

Due to the volume available for tertiary containment greatly exceeding the 110% and 25% rules for the stored inventory, this is not used in calculations.

5.2.2 Rainfall

The rainfall event, as defined in Table 3, was determined to be 56.94mm which, on a catchment area of $3,794m^2$, would therefore produce a surface water runoff volume of $238m^3$. The catchment excludes the reception building roof area which has isolated collection and deemed unlikely to fail in the event of a fire due to steel construction. The probability of this event, as defined in the guidelines, is $2.74x10^{-4}$.

5.2.3 Firefighting and Cooling Water

The potential quantity of water required to fight a fire and the probability of a fire occurring was calculated on the same basis as described in Section 5.1.3 and calculated for the largest

pile in this location; material temporarily stored in the reception hall. On this basis, for a maximum pile size of 750m^3, the required firefighting water equates to 900m^3.

This results in a probability of a fire occurring on any one day of 3.65x10^{-5}.

5.3 Scenario Probability

Guidance in CIRIA C736 (see Section 4.1 and 4.3)) appears to suggest that the required containment capacity should take account of all three sources of water described above. This guidance was developed primarily for hydrocarbon storage facilities, where the consequences of loss of containment would likely be significantly more serious than a fugitive release of water from a composting plant. Thus, whilst C736 requires a worst-case scenario, for a composting site this is not a credible worst-case scenario, which is also a requirement of the guidance.

Using the 'simple' worst-case scenario (all tanks fail, plus rainfall event, plus firefighting and cooling water) would result in highly conservative predictions. This is illustrated in Table 4 and Table 5, which presents the probabilities for the scenarios described above occurring on a specific day, assuming that they are entirely independent.

Table 4 Probability of scenarios – northern site

№	Scenario	Probability
3	Rainfall event	2.74E-04
1	One leachate tank fails	1.37E-04
2	Firefighting	3.65E-05
5	One leachate tank fails plus rainfall event	3.75E-08
4	Both leachate tanks fail	1.88E-08
6	Rainfall event plus firefighting	1.00E-08
7	Both leachate tanks fail plus rainfall event	5.14E-12
8	One leachate tank fails plus rainfall event plus firefighting	1.37E-12
9	Both leachate tanks fail plus rainfall event plus firefighting	1.88E-16

Table 5 Probability of scenarios – southern site		
№	Scenario	Probability
1	One leachate tank fails	2.19E-03
3	Rainfall event	2.74E-04
6	Firefighting	3.65E-05
2	All leachate & water storage tanks fail	4.80E-06
4	One leachate tank fails plus rainfall event	6.00E-07
7	Rainfall event plus firefighting	1.00E-08
5	All leachate & water storage tanks fail plus rainfall event	1.32E-09
8	One leachate tank fails plus rainfall event plus firefighting	2.19E-11
9	All leachate & water storage tanks fail plus rainfall event plus firefighting	4.81E-14

5.4 Assessment of Risk

CQAI proposes that a risk-based approach should be used to select the appropriate scenario for calculation of a credible worst-case basis for required containment capacity. In this assessment, the "risk" is the same in each case and so the variable parameter is the probability of occurrence of one or more events on the same day.

As the events are independent, the calculated probabilities of combined events are extremely low, with return periods much longer than the design life of the facility. The risk-based calculation of potential scenarios is, therefore, based on the occurrence of individual events. The potential for linked events should also be assessed for the Site.

The event magnitude versus the estimated return period of unlinked simultaneous events occurring is presented on Figure 3 and Figure 4.

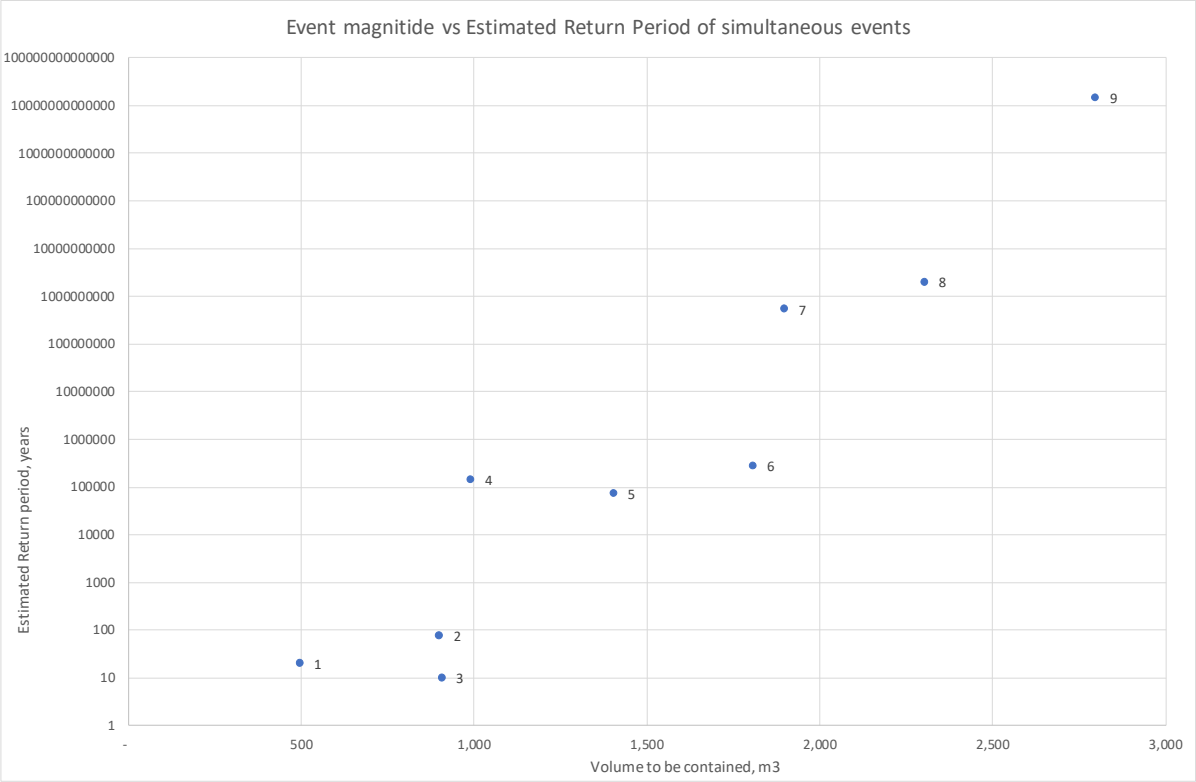


Figure 3 Event magnitude vs estimated return period – northern site

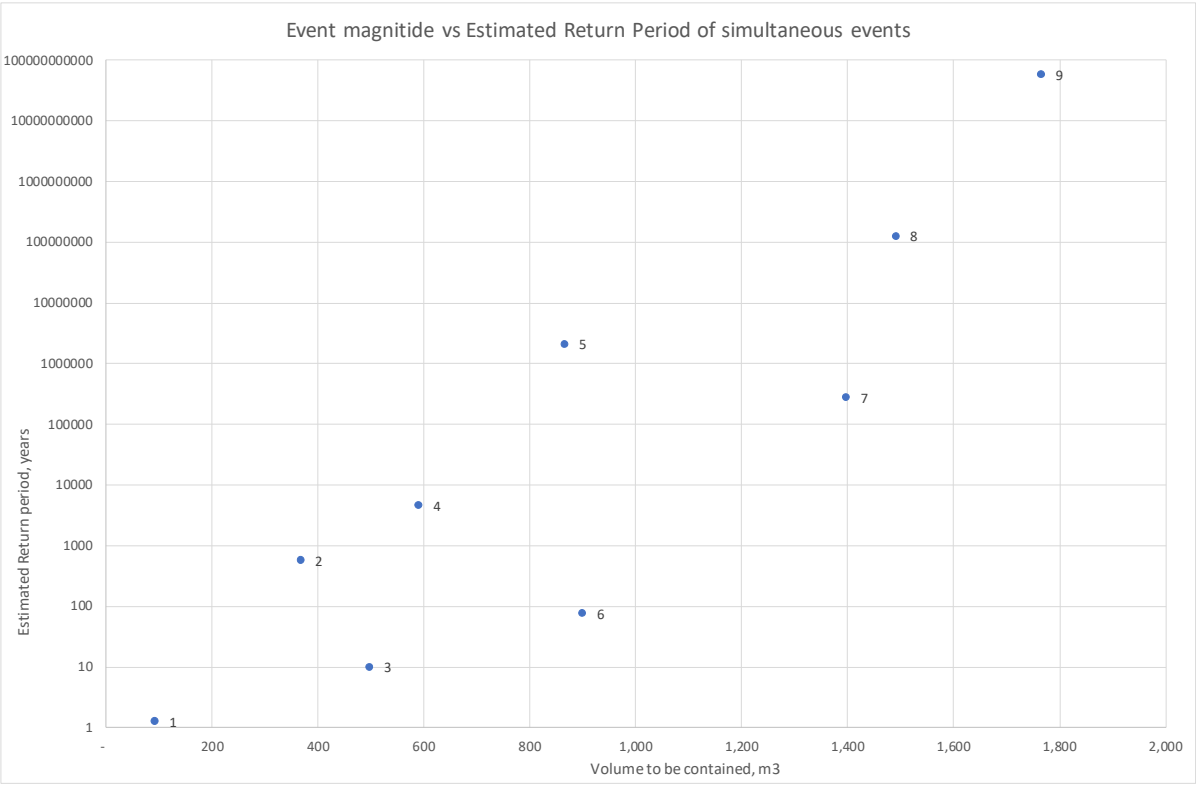


Figure 4 Event magnitude vs estimated return period – southern site

5.5 Containment Requirement

The potential volumes of water that would require storage by the secondary containment system under the scenarios discussed above are presented below. It will be necessary to adjust the designed capacity for the volume of compost in any windrows or storage piles that fall within the extent of temporary ponding in the containment system. This calculation could include the effective porosity of the compost, if appropriate.

5.5.1 Northern Site

The water volumes for different scenarios that would require storage by the site wide containment system are summarised in Table 6. It demonstrates that the worst-case scenario would require a total containment volume of 2,798m^3. However, the probability of this event occurring is so small that it may not be considered as credible.

The credibility of multiple or linked events occurring based upon credible return periods ranges from 496m^3 to 907m^3. Incorporating a modest 'factor of safety' of 1.5, in line with typical engineering applications the required secondary containment is determined to be 1,360m^3.

This should be confirmed by a Site wide risk assessment as part of a systematic hazard identification study. The risk should be as low as is reasonably practicable (ALARP) and the volume be proportionate to the facility.

Table 6 Water volumes for different scenarios – northern site

№	Scenario	Volume, m^3
1	One leachate tank fails	496
2	Firefighting	900
3	Rainfall event	907
4	All leachate tanks fail	991
5	One leachate tank fails plus rainfall event	1,403
6	Rainfall event plus firefighting	1,807
7	All leachate tanks fail plus rainfall event	1,898
8	One leachate tank fails plus rainfall event plus firefighting	2,303
9	All leachate & water storage tanks fail plus rainfall event plus firefighting	2,798

5.5.2 Southern Site

The water volumes for different scenarios that would require storage by the site wide containment system are summarised in Table 7. It demonstrates that the worst-case scenario would require a total containment volume of 1,766m^3. However, the probability of this event occurring is so small that it may not be considered as credible.

The credibility of multiple or linked events occurring based upon credible return periods ranges from 93m^3 to 900m^3. Incorporating a modest 'factor of safety' of 1.5, in line with typical engineering applications the required secondary containment is determined to be 1,350m^3.

This should be confirmed by a Site wide risk assessment as part of a systematic hazard identification study. The risk should be as low as is reasonably practicable (ALARP) and the volume be proportionate to the facility.

Table 7 Water volumes for different scenarios – southern site

№	Scenario	Volume, m^3
1	One leachate tank fails	93
2	All leachate & water storage tanks fail	368
3	Rainfall event	498
4	One leachate tank fails plus rainfall event	591
5	All leachate & water storage tanks fail plus rainfall event	866
6	Firefighting	900
7	Rainfall event plus firefighting	1,398
8	One leachate tank fails plus rainfall event plus firefighting	1,491
9	All leachate & water storage tanks fail plus rainfall event plus firefighting	1,766

6. Spill Mapping Assessment

6.1 Modelling Parameters

The spill mapping assessment uses the DEM to model the Sites to determine the maximum containment provided by the current configuration. The topographic survey is presented as Drawing Ref: 30408/WLC/SM/01.

The drainage systems are assumed to not provide pathways from the containment areas.

6.2 Northern Area

Drawing Ref: 30408/WLC/SM/2a presents the northern site in its current configuration. The assessment drawings are included in Appendix C.

The Site falls to the north west where surface water is collected as leachate by an open surface water collection channel which flows to a pumped sump, then into two leachate storage tanks. A third tank to the east is used to store clean water for firefighting. Partial containment is provided around the northern and western aspects of Site.

The spill mapping assessment demonstrates the Sites maximum containment volume in its current configuration is 208m^3, as shown on Drawing Ref: 30408/WLC/SM/2b. The breach point is in the north western corner, at 57.120mAOD.

6.3 Southern Area

Drawing Ref: 30408/WLC/SM/3a presents the southern Site in its current configuration. The assessment drawings are included in Appendix D.

The assessment demonstrates that the Site has three independent zones: Reception hall; eastern area; and southern area. These zones are segregated by topography and falls on site. The reception hall building provides a small amount of containment in floor pits, however as they would be filled with waste during a worst case scenario event they are removed from the assessment. The reception building is therefore assessed as having no containment.

The eastern area of Site has a fall to the north east where under normal operations water flows to a sump and is pumped to the eastern leachate storage tank. The spill mapping assessment demonstrates the maximum containment volume in the eastern areas current configuration is 144m^3. The breach point is at 67.593mAOD.

The southern area of Site has a fall to the south west where under normal operations water flows to a sump and is pumped to one of three leachate storage tanks located in this area.

The spill mapping assessment demonstrates the maximum containment volume in the eastern areas current configuration is 234m^3. The breach point is at 67.570mAOD.

The south Sites maximum combined above ground containment volume is 378m^3. This does not include the drainage system capacity or any tank capacity. Details are presented on Drawing Ref: 30408/WLC/SM/2b.

7. Containment System Capacity Modelling

7.1 Modelling Parameters

The containment system capacity modelling uses the volumes determined in section 5.5.

The modelled secondary containment requirements include a minimum 50mm freeboard, and where dynamic effect (surge from tank failure) is required this is increased to a minimum 250mm freeboard. The assessment does not take into account the required freeboard for firefighting foam as its use is unlikely.

The modelling used existing impermeable surfaces to determine the extent of the secondary containment area. This was used to identify the extents and elevations for the required secondary containment.

7.2 Northern Site Requirements

The modelling is based on the extent of windrows on the northern Site present during the October 2020 survey. It assumes this configuration is typical of normal operations. As the windrows occupy part of the containment area it is necessary to increase the containment on the slab accordingly. The compost in the windrows is modelled as having 40% porosity.

The northern Site has a required containment volume requirement of 1,360m^3, modified to account for windrows/stockpiles in this are increases the required containment volume to 1,397m^3.

The extent of the credible worst-case scenario event is shown on Drawing Ref: 30408/WLC/SM/2c and the requirements for containment infrastructure improvements are presented on Drawing Ref: 30408/WLC/SM/2d.

The existing secondary containment was previously deemed insufficient in terms of its adherence to industry best practice and should be replaced with suitably designed and constructed containment systems in line with the requirements of CIRIA C736. The height of the bund wall from the existing surface varies due to the fall over the area. Drawing Ref: 30408/WLC/SM/2e details the elevation at multiple positions around the perimeter of the existing impermeable surface, and also details the increase in elevation required to achieve the required containment.

Kerbing should be installed to direct any surface water to the contained area and reduce the risk of any surface water flow onto the composting pad as shown.

7.3 Southern Site Requirements

The southern Site has a required containment volume requirement of 1,350m^3.

The extent of a credible worst-case scenario event is shown on Drawing Ref: 30408/WLC/SM/3c and the requirements for containment infrastructure improvements are presented on Drawing Ref: 30408/WLC/SM/3d.

The existing secondary containment was deemed suitable in terms of construction and function; however, the designer should confirm if the elevation of the existing bund wall can be increased. Drawing Ref: 30408/WLC/SM/3e details the elevation at positions around the perimeter of the existing impermeable surface, and also details the increase in elevation of the bund wall required to achieve the required containment.

The reception building will form part of the containment area and modifications are required to provide containment in this area. Modifications may include the sealing of joints between the precast concrete units forming the wall of the building, and between the walls and concrete floor. It may be deemed more viable to construct an independent containment wall to the required elevations within the building. The building entry points elevations need to be increased to achieve the required containment. This may comprise speed hump type modifications.

Door 4 of the reception building may require installation of a flood gate to provide containment as the required elevation increase at the entrance may prove problematic if it is to remain in use. A flood gate would allow containment to be achieved whilst still allowing periodic access.

7.4 Containment Design Considerations

The installation of secondary containment systems should be undertaken according to a specific detailed design including a technical specification, construction details and measures to tie-in to existing infrastructure.

The design should be prepared considering the recommendations of this report and compliant with CIRIA C736 guidance.

Key design considerations are summarised in Table 8. If the design varies greatly from these suggestions, the modelled spills and capacity may need to be revised. The current details of surfaces and drainage systems should be confirmed prior to remedial works being undertaken to ensure that these features do not compromise containment.

Construction quality assurance (CQA) should be implemented to confirm that the construction works comply with the design. A CQA inspector should compile a validation report upon completion of the works to confirm that construction was undertaken compliant

with the design. A topographic (3D) survey should be undertaken after completion of the works enabling the increased containment volumes to be confirmed.

Table 8 Design considerations	
General Considerations	• Height of wall and structural independence. • Freeboard. • Proximity to bund. • Jetting. • Leakage detection from primary containment vessel considered where primary containment vessel rests on bund floor. • Pumped drainage from bunds. Pipework penetration seals.
In-Situ Reinforced Concrete and Masonry Bund walls	• Competence - Design and construction should be completed by competent persons/organisations. • In situ reinforced concrete bunds should be designed to EN 1992-3:2006 as liquid-containing and retaining structures. • Joints – Water bars to be Installed in expansion and contraction joints, be resistant to attack by inventory and be fire resistant where flammable inventory is stored. • Kicker joints – Water bars to be installed in kicker joints. Reinforced masonry bunds suitable where inventory is not flammable.
Transfer Systems	• Catchment surfacing to be resistant to inventory and fire. • Transfer system capacity designed to cater for flows arising from a credible worst-case scenario. • Pipework and channels designed to be liquid tight and resistant to inventory and assessment of material suitability. Pumps - Where the transfer system is reliant on pumping, provision for failure to be considered.

8. Key Recommendations

This section highlights the key recommendations derived from the spill mapping assessment and containment system capacity modelling.

The site should use the information presented to undertake a risk assessment (RA) as part of the systematic hazard identification study of the facility to confirm the credibility of multiple or linked spill events occurring is in line with that presented in this report. This should confirm mitigating measures are in place to prevent incidents such as siphoning of tanks cannot take place, protection is installed around tanks to prevent vehicle collision and that the fire prevention plan is current and being followed on site. This will enable determination of the most *credible* worst-case scenario. The RA should follow the ALARP (As Low as Reasonably Possible) rule.

Where modifications to the infrastructure have been identified, the design of the structure will be required to meet CIRIA C736 and it is recommended that construction quality assurance is conducted during the works. A further topography mapping exercise can be conducted to record the final construction details which will support the facility construction/as-built records. These engineering solutions should be integrated without significant disruption to the Site following agreement with the regulator.

Containment requirements and detailed design should be agreed with the Regulator.

9. References

"CIRIA C736: Containment systems for the prevention of pollution, Secondary, tertiary and other measures for industrial and commercial premises, 2014".

"West London Composting; Containment System Retrospective Assessment Report, November 2019, prepared by CQA International Ltd".

Fire Prevention Plan, Ref WLC13, Issue 05 (12/04/19).

UK Gov guidance no climate change allowances https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

EN 1992-3:2006: Eurocode 2. Design of concrete structures. Liquid retaining and containing structures.

Appendix A Supporting Data

Northern site												
Catchment												
		Area	14480	m^2								
Existing Containment												
		Current containment elevation	57.12	mAOD								
		Volume over site around windrows	121	m^3								
		Volume over windrow footprint	217	m^3								
		FAS Free air space within compost in windrows	40%									
		Volume of water taken up in FAS in windrows	86.8	m^3								
		Containment on slab with windrows	**208**	**m^3**								
		Total containment if leachate tanks are empty	1199	m^3								
	Storage tanks											
			elevation base	elevation top	Height	diameter	Area	freeboard	Water depth	Capacity		
										freeboard	brimful	110% of brimful
			mAOD	mAOD	m	m	m^2	m	m	m^3	m^3	m^3
		Tank 1 Leachate	57.100	61.720	4.62	12	113.10	0.25	4.37	494	523	575
		Tank 2 Leachate	57.100	61.740	4.64	12	113.10	0.25	4.39	496	525	577
		Tank 3 Clean water	57.100	61.740	4.64	7.5	44.18	0.25	4.39	194	205	225
									Total	1185	1252	1377
		Tank with the largest capacity									**525**	**577**
		25% of total tank capacity at freeboard level								**296**		
Water inputs onto site												
	Rainfall											
		Rainfall 24 hour 1 in 10 year	56.94	mm	Flood estimation handbook							
		Climate change adjustment	10%	%	https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances							
		Rainfall adjusted for climate change	62.63	mm								
		Rainfall volume over catchment	907	m^3								
	Fire fighting water required (from EA Guidance)											
		Pile size (windrow, oversize etc)	300	m^3								
		Water flow required FPP Guidance V3 - EA	2000	l/min								
		Duration	180	min								
		Water used	360	m^3								
	Fire fighting water required for specific pile size											
		Pile size (windrow, oversize etc)	750	m^3								
		Water required	900	m^3								
Containment required for various incidents												
	1	Rainfall	907	m^3								
	2	Fire	900	m^3								
	3	Largest tank failure	577	m^3								
		Incident with largest containment requirement	907	m^3								
		Factor of safety	150%									
		Containment required	1360	m^3								
Modified containment												
		Water elevation	57.510	mAOD								
	Containment											
		Required containment volume	1360									
		Volume over site around windrows	891	m^3								
		Volume over windrow footprint	1265	m^3								
		FAS Free air space within compost in windrows	40%									
		Volume of water in absorbed in windrows	506									
		Containment on slab with windrows	1397	m^3								
	Containment wall elevation											
		Increase above exitisting bund spill point	0.39	m								
		Dynamic effect (surge from tank failure)	250	mm								
		Is Freeboard for fire fighting foam required	**N**									
		Freeboard	50	mm	freeboard only 50mm as unlikley to use foam, if foam is used the amount of fire water used is reduced hence water elevation and hence free board increases							
		Containment Wall elevation	57.560	mAOD								
		Containment Wall elevation that might be subject to Dynamic effect (surge from tank failure)	57.760	mAOD								

Southern site														
Storage tanks														
	Tanks within containment area												Capacity	
				elevation base	elevation top	Height	diameter	Area	freeboard	liquid depth	freeboard	brimful	110% of brimful	
			Tank 1 leachate east	67.544	69.940	2.40	7.43	43.40	0.25	2.15	93	104	114	
			Tank 2 leachate south	67.888	70.970	3.08	5.62	24.85	0.25	2.83	70	77	84	
			Tank 3 leachate south	67.887	70.960	3.07	5.65	25.06	0.25	2.82	71	77	85	
			Tank 4 leachate south	67.888	70.960	3.07	5.68	25.33	0.25	2.82	71	78	86	
			Tank 7 water south	68.300	72.800	4.50	2.50	4.91	0.25	4.25	21	22	24	
			Tank 8 water south	68.300	72.800	4.50	2.50	4.91	0.25	4.25	21	22	24	
			Tank 9 water south	68.300	72.800	4.50	2.50	4.91	0.25	4.25	21	22	24	
										Total	368	402	442	
			Tank with the largest capacity									**104**	**114**	
			25% of total tank capacity at freeboard level								**92**			
Catchment														
	Total													
		Eastern and Southern		7949	m^2									
Existing Containment														
	Eastern (around eastern invessel composting units)													
		Rainwater catchment area												
			Area	3794	m^2									
			Rainfall	238	m^3									
		Existing containment eastern area												
			Lowest point next to surface drain outside reception hall doors	67.593	mAOD									
			Max water level	67.593	mAOD									
			Volume around invessel composting units	144	m^3									
			Total flooded area containment volume	144	m^3									
			Leachate tank volume	93	m^3									
			Total containment volume	237	m^3									
	Southern (around southern invessel composting units)													
		Rainwater catchment area												
			Area	4155	m^2									
			Rainfall	260	m^3									
		Existing containment southern area												
			Low point next to entrance into reception hall	67.570	mAOD									
			Max water level	67.570	mAOD									
			containment volume around invessel composting units	234	m^3									
			Leachate tanks total volume	213	m^3									
			Total containment volume	447	m^3									
	Reception Hall													
		Floor												
			Area	2420	m2	(rainfall excluded as unlikely roof collapse would occur during fire)								
			Max height	67.767	mAOD									
			Min height	67.381	mAOD									
		Entrance floor elevations												
			Door 1	67.683	mAOD									
			Door 2	67.772	mAOD									
			Door 3	67.758	mAOD									
			Door 4	67.520	mAOD									
			Rear door	67.567	mAOD									
Water inputs onto site														
		Rainfall												
			Rainfall 24 hour 1 in 10 year	56.94	mm	Flood estimation handbook								
			Climate change adjustment	10%	%	https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances								
			Rainfall adjusted for climate change	62.63	mm									
			Rainfall volume over catchment	498	m^3									
		Fire fighting water												
			Pile size (windrow, oversize etc)	300	m^3									
			Water flow required FPP Guidance V3 - EA	2000	l/min									
			Duration	180	min									
			Water used	360	m^3									
		Fire fighting water required for specific pile size												
			Pile size (windrow, oversize etc)	750	m^3									
			Water required	900	m^3									
	Containment required for various incidents													
		1	Rainfall	498	m^3									
		2	Fire	900	m^3									
		3	Largest tank failure	114	m^3									
			Incident with largest containment requirement	900	m^3									
			Factor of safety	150%										
			Containment required	1350	m^3									
	In-vessel composting units													
		Lowest point on containment walls												
			Around eastern IVC units	67.654	mAOD									
			Around southern IVC units	67.653	mAOD									

Modifications required					
	For fire water discharged into reception hall				
		The water discharged into the reception hall has to be discarged out the rear door to be captured in the containment area around the southern IVC units			
		To account for possible resitriction in the flow out of the rear door by debris on the floor the containment level required around the interior of the reception hall wall and door 1 through 4 should be a minium of 100mm above the rear door floor elevation			
	Containment wall height above maximum water level				
		Dynamic effect (surge from tank failure)	250	mm	
		Fire foam allowance if required	100	mm	
	Containment provided by modified wall height around invessel composting units and entrance/exits to reception hall				
		Modified for event			
		Water elevation	67.745	mAOD	
		Containment			
		Required volume	1350	m^3	
		Volume Actual volume	1360	m^3	
		Lowest point on containment walls			
		Around eastern IVC units	67.654	mAOD	
		Around southern IVC units	67.653	mAOD	
		Modifications required			
		Reception hall			
		Raise entrances 1, 2, 3 & 4 above water level by minimum	50	mm	
		Raise entrances 1, 2, 3 & 4 to level of	67.795	mAOD	
		Door 1 install speed hump type ramp to raise entrance height by	112	mm	
		Door 3 install speed hump type ramp to raise entrance height by	37	mm	
		Door 4 install speed hump type ramp to raise entrance height by	275	mm	
		Seal joint between concrete wall panels of reception hall to a minimum height of	67.795	mAOD	
		Seal joint between concrete wall panels and floor of reception hall to a minimum height of	67.795	mAOD	
		In Vessel Composting Units			
		Raise wall heights around IVC units to minimum elevation of	67.795	mAOD	
		Raise sections of wall that might be subject to Dynamic effect (surge from tank failure) above the max water level by	250	mm	
		Wall heights subject to dynamic effects	67.995	mAOD	

RAINFALL MODELLING FOR POINT DATA AT 507098,188144

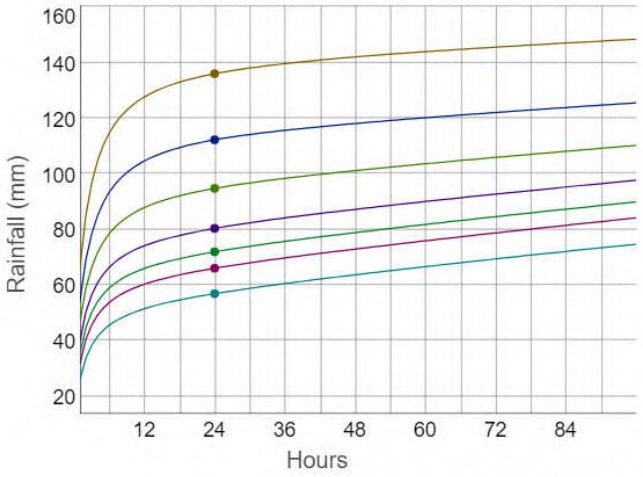
FEH 2013

Point rainfall at 507098, 188144

Design Rainfall Event Rarity

Duration	24	Hours
Return period	10	Years
Depth	56.94	mm

Calculate



24.0h (1.0days):
500yr: 136.11mm
200yr: 112.32mm
100yr: 94.82mm
50yr: 80.45mm
30yr: 72.00mm
20yr: 66.09mm
10yr: 56.94mm

Save graph as image Export design rainfall (CSV)

A design rainfall of 56.94 mm was calculated.

This design rainfall has been calculated for a return period on the annual maximum scale.

Return period options
- Annual maximum
- Peaks over threshold

Duration options
- Fixed
- Sliding

Appendix B Topographic Survey

N

NOTES

Survey Date: October 2020

Survey undertaken by CQA International Ltd

LEGEND

Ponds

St Leonard's Farm

Newyears Green

NEWYEARS GREEN

Highview Bungalow

Mast

Pylon Farm

Pond

0	02/12/2020	DB	First issue
Rev	Date	Chkd	Description

PROJECT TITLE
Spill Mapping & Containment System Capacity Modelling

PROJECT NUMBER
30408

CLIENT
West London Composting Ltd

LOCATION
Newyears Green Ln, Harefield, Uxbridge UB9 6LX

DRAWING TITLE
Topographic Survey

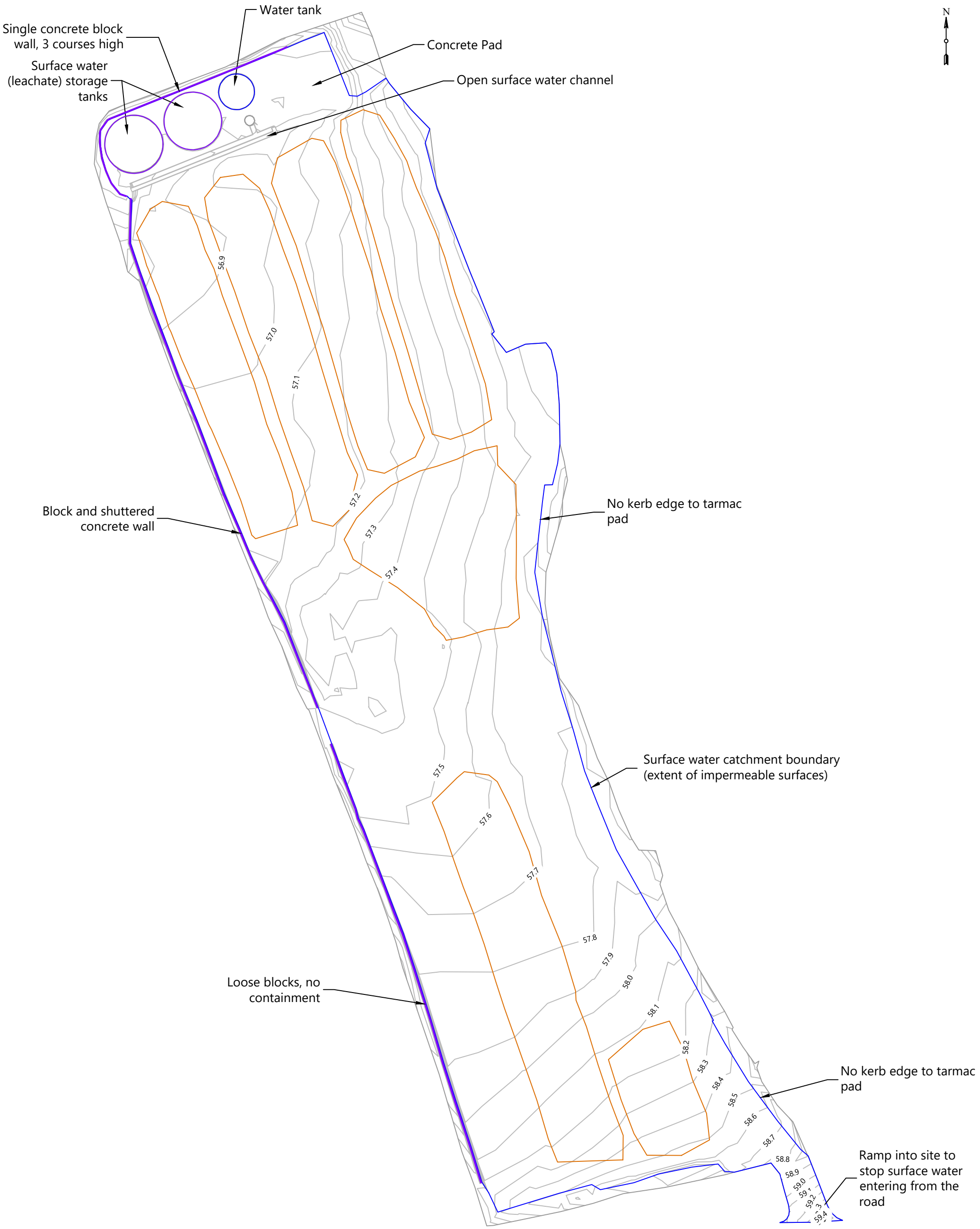
DESIGNED	RWS	DRAWN	RWS
SCALES @ A1	1:750	DATE	02/12/2020

CQA INTERNATIONAL LTD

DRAWING NUMBER
30408/WLC/SM/01

REV
00

Appendix C Assessment and Modelling – Northern Site



CLIENT: West London Composting Ltd	PROJECT TITLE: Spill Mapping & Containment System Capacity Modelling	DESIGNED RWS	DRAWN RWS
LOCATION: Newyears Green Ln, Harefield, Uxbridge UB9 6LX	TITLE: Northern site - Existing Layout	APPROVED DB	DATE 08/12/2020
NOTES		REVISIONS	

Rev	Date	Chkd	Description
0	08/12/2020	DB	First issue

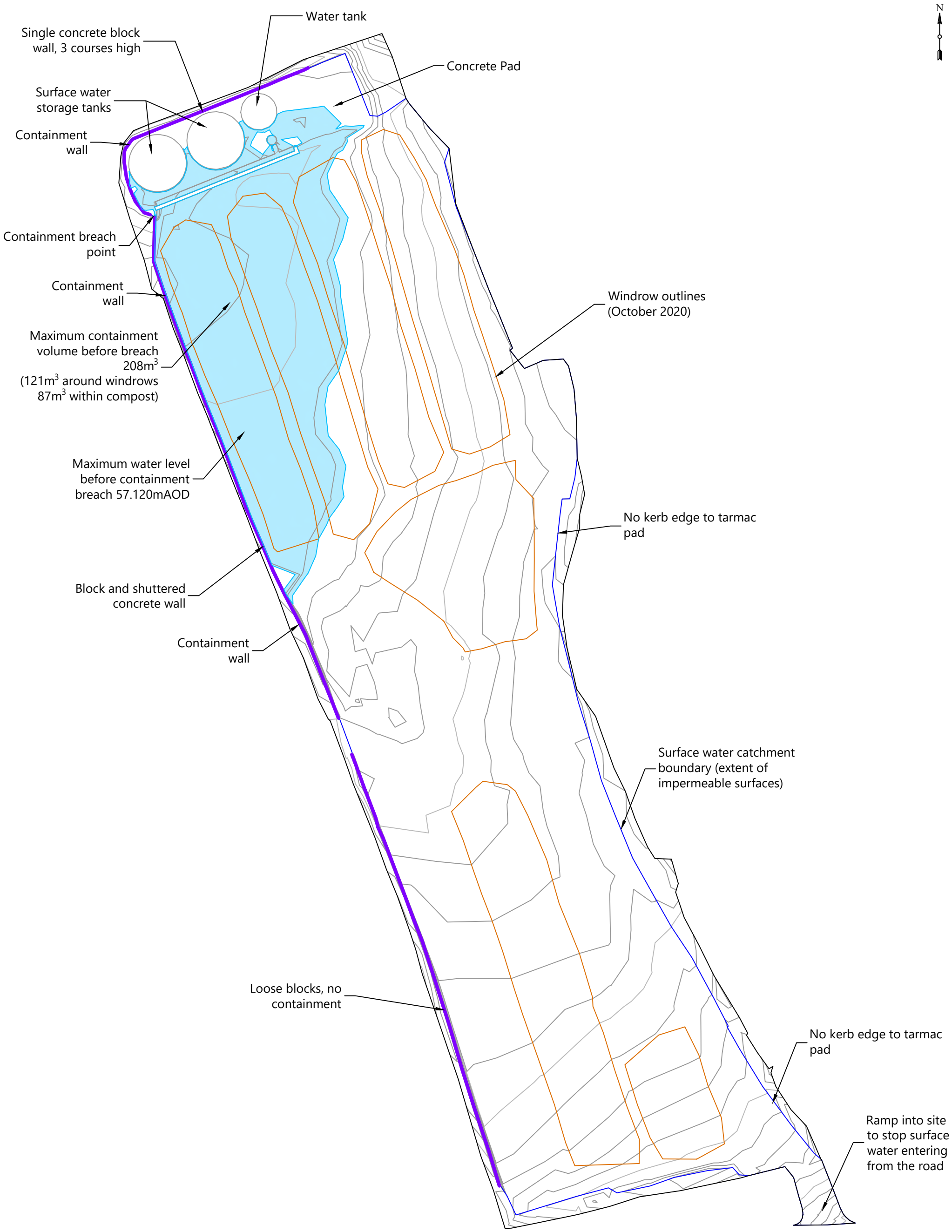
CQA INTERNATIONAL LTD

DRAWING NUMBER 30408/WLC/SM/2a

REV 00

PROJECT NUMBER 30408

SCALE @ A3 1:750



CLIENT: West London Composting Ltd	PROJECT TITLE: Spill Mapping & Containment System Capacity Modelling	DESIGNED RWS	DRAWN RWS
LOCATION: Newyears Green Ln, Harefield, Uxbridge UB9 6LX	TITLE: Northern site - Spill Map (Existing conditions)	APPROVED DB	DATE 08/12/2020
NOTES		REVISIONS	

Rev	Date	Chkd	Description
0	08/12/2020	DB	First issue

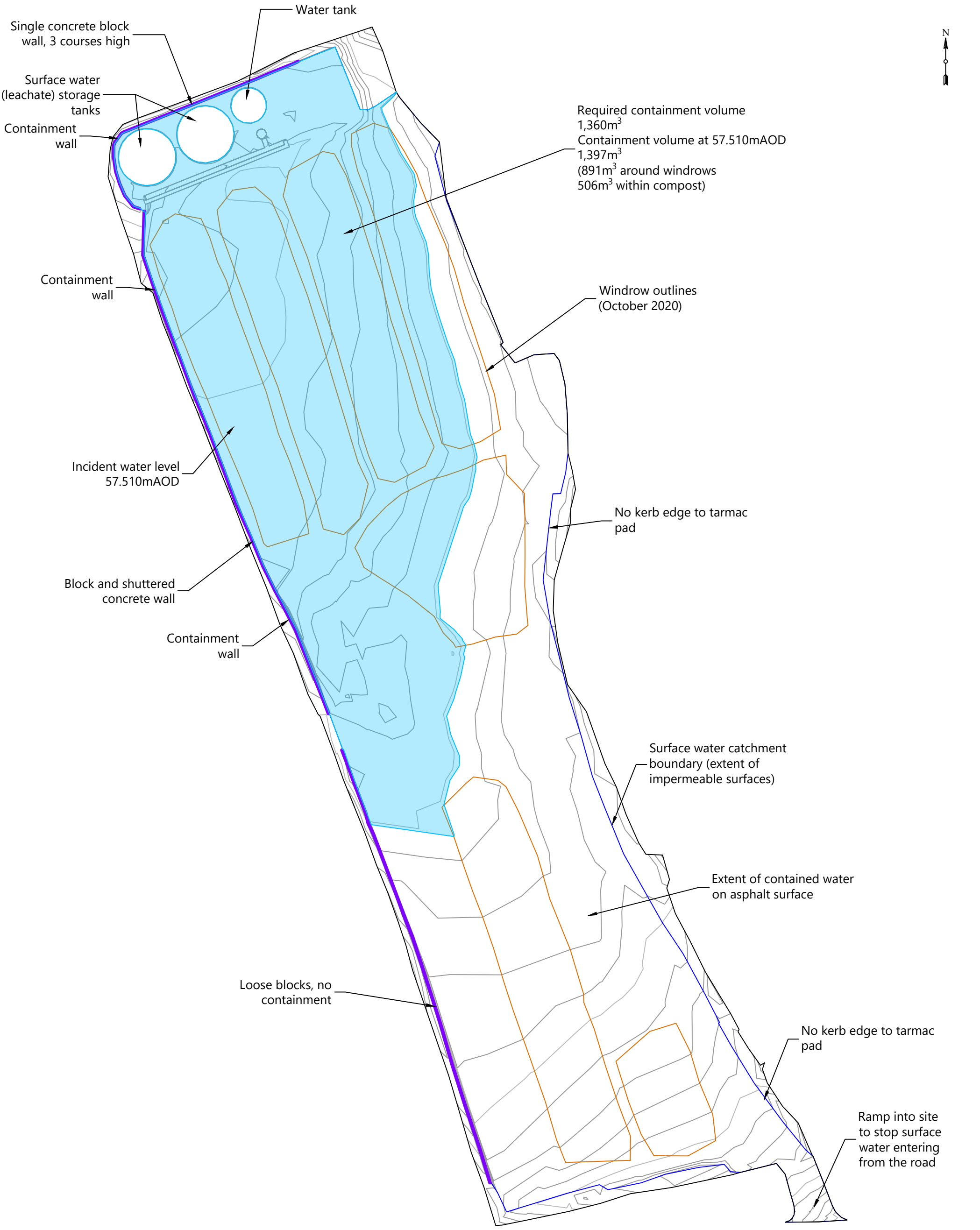
CQA INTERNATIONAL LTD

DRAWING NUMBER 30408/WLC/SM/2b

REV 00

PROJECT NUMBER 30408

SCALE @ A3 1:750



CLIENT: West London Composting Ltd	PROJECT TITLE: Spill Mapping & Containment System Capacity Modelling	DESIGNED RWS	DRAWN RWS
LOCATION: Newyears Green Ln, Harefield, Uxbridge UB9 6LX	TITLE: Northern site - Containment Model (required Conditions)	APPROVED DB	DATE 08/12/2020
NOTES		REVISIONS	

Rev	Date	Chkd	Description
0	08/12/2020	DB	First issue

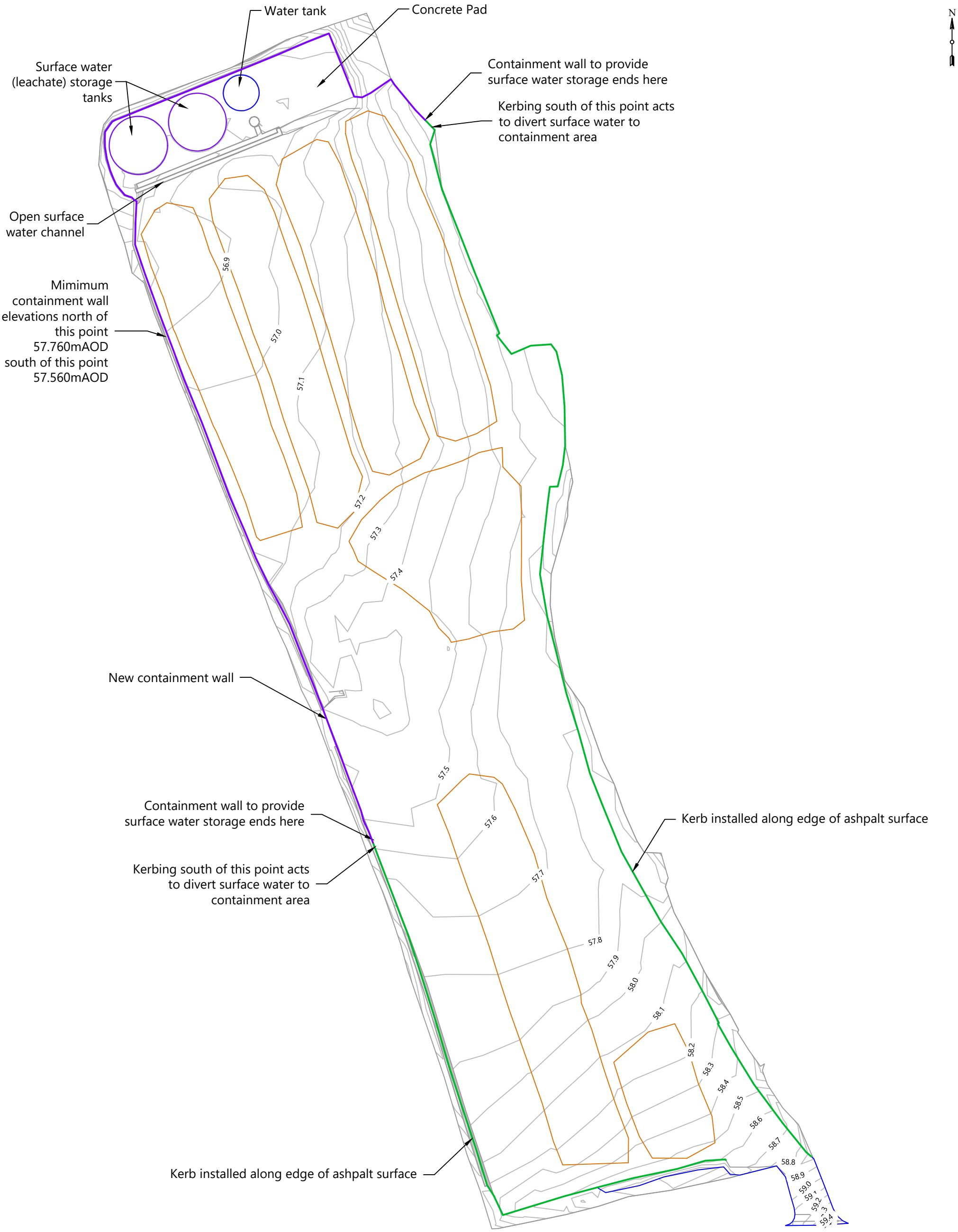
CQA INTERNATIONAL LTD

DRAWING NUMBER 30408/WLC/SM/2c

REV 00

PROJECT NUMBER 30408

SCALE @ A3 1:750



CLIENT: West London Composting Ltd	PROJECT TITLE: Spill Mapping & Containment System Capacity Modelling	DESIGNED RWS	DRAWN RWS
LOCATION: Newyears Green Ln, Harefield, Uxbridge UB9 6LX	TITLE: Northern site - Required Containment Infrastructure	APPROVED DB	DATE 08/12/2020
NOTES		REVISIONS	

Rev	Date	Chkd	Description
0	08/12/2020	DB	First issue

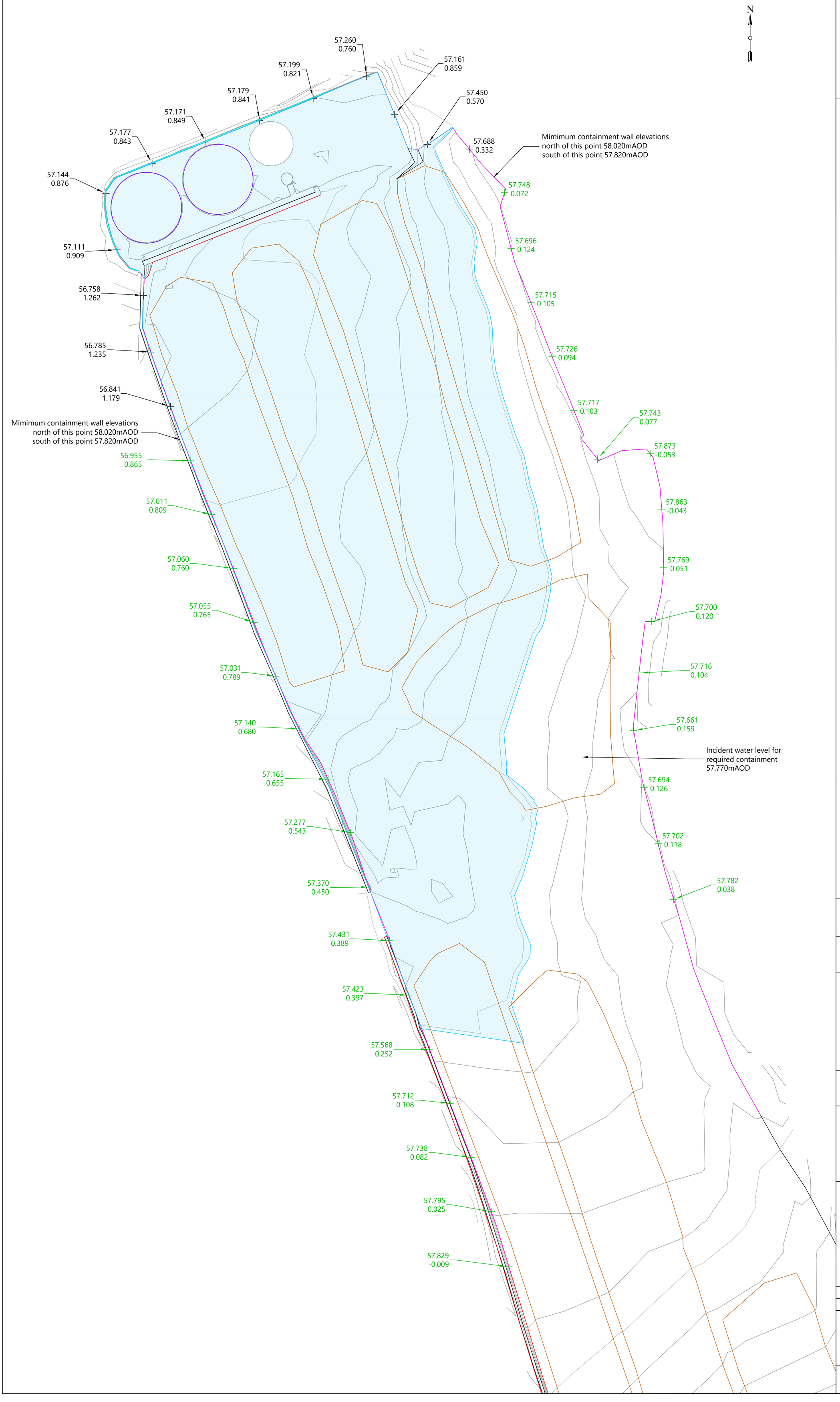
CQA INTERNATIONAL LTD

DRAWING NUMBER 30408/WLC/SM/2d

REV 00

PROJECT NUMBER 30408

SCALE @ A3 1:750



NOTES

LEGEND

57.011
0.809

Spot heights shown in green are for the required containment infrastructure

These show:-

1. The upper value is elevation of the impermeable surface upon which, the existing walls are constructed
2. The lower value is the minimum height of the containment infrastructure required for containment or diversion of incident water
3. Where the lower value is a negative value the existing containment is of sufficient height
4. These heights are based on a minimum containment infrastructure elevation of 57.560

57.179
0.841

Spot heights shown in black are for the section of containment infrastructure that may be subject to a surge event

These show:-

1. The upper value is elevation of the impermeable surface upon which, the existing walls are constructed
2. The lower value is the minimum height of the containment infrastructure required for containment or diversion of incident water
3. These heights are based on adding an additional 250mm to the minimum infrastructure elevation

PROJECT TITLE
Spill Mapping & Containment System Capacity Modelling

PROJECT NUMBER
30408

CLIENT
West London Composting Ltd

LOCATION
Newyears Green Ln, Harefield, Uxbridge UB9 6LX

DRAWING TITLE
Minimum Heights of Containment Infrastructure for Incident Water

REVISIONS

Rev	Date	Chkd	Description
0	10/12/2020	DB	First issue

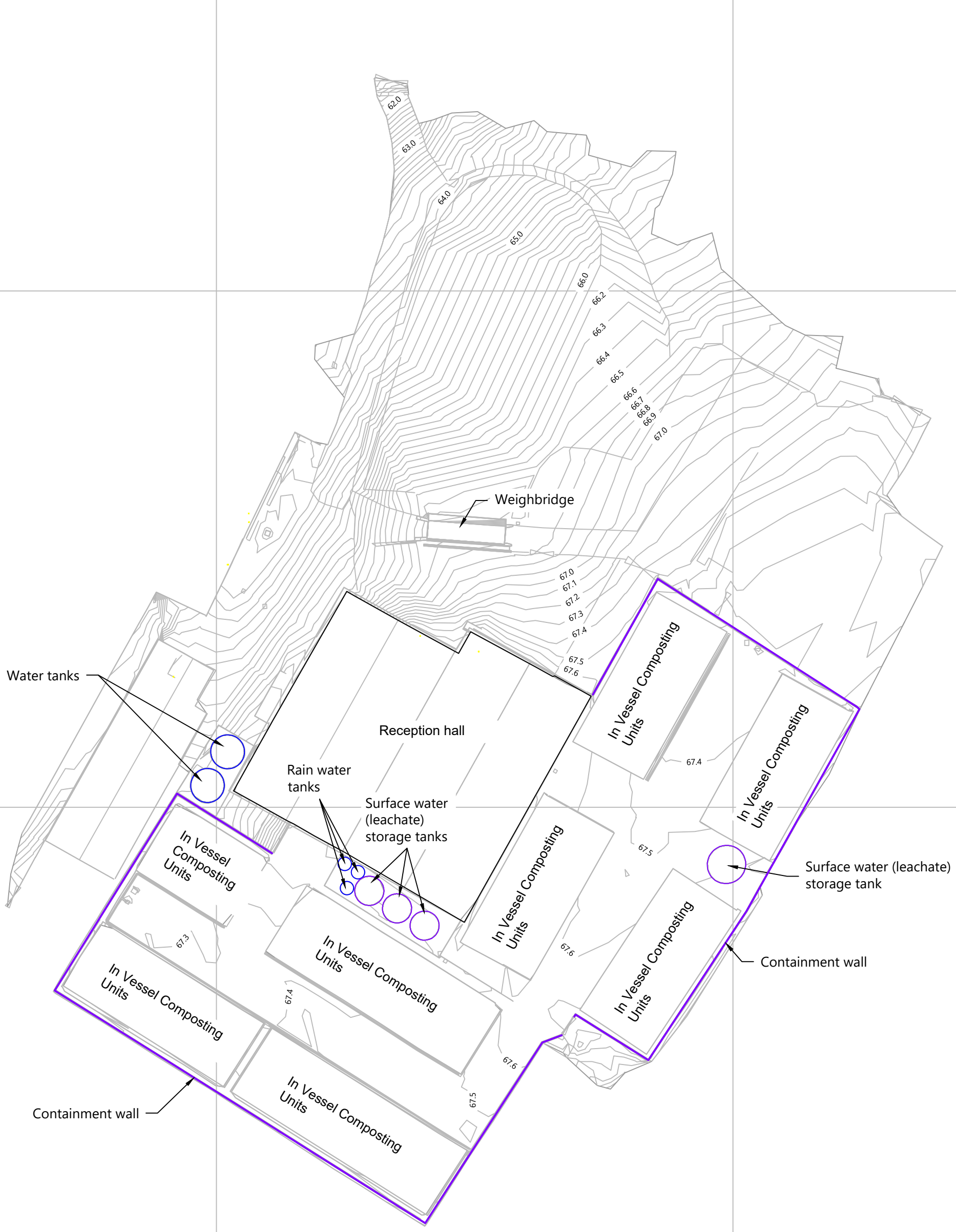
DESIGNED	RWS	DRAWN	RWS
SCALES @ A1	1:750	DATE	10/12/2020

CQA INTERNATIONAL LTD

DRAWING NUMBER
30408/WLC/SM/02e

REV
00

Appendix D Assessment and Modelling - Southern Site



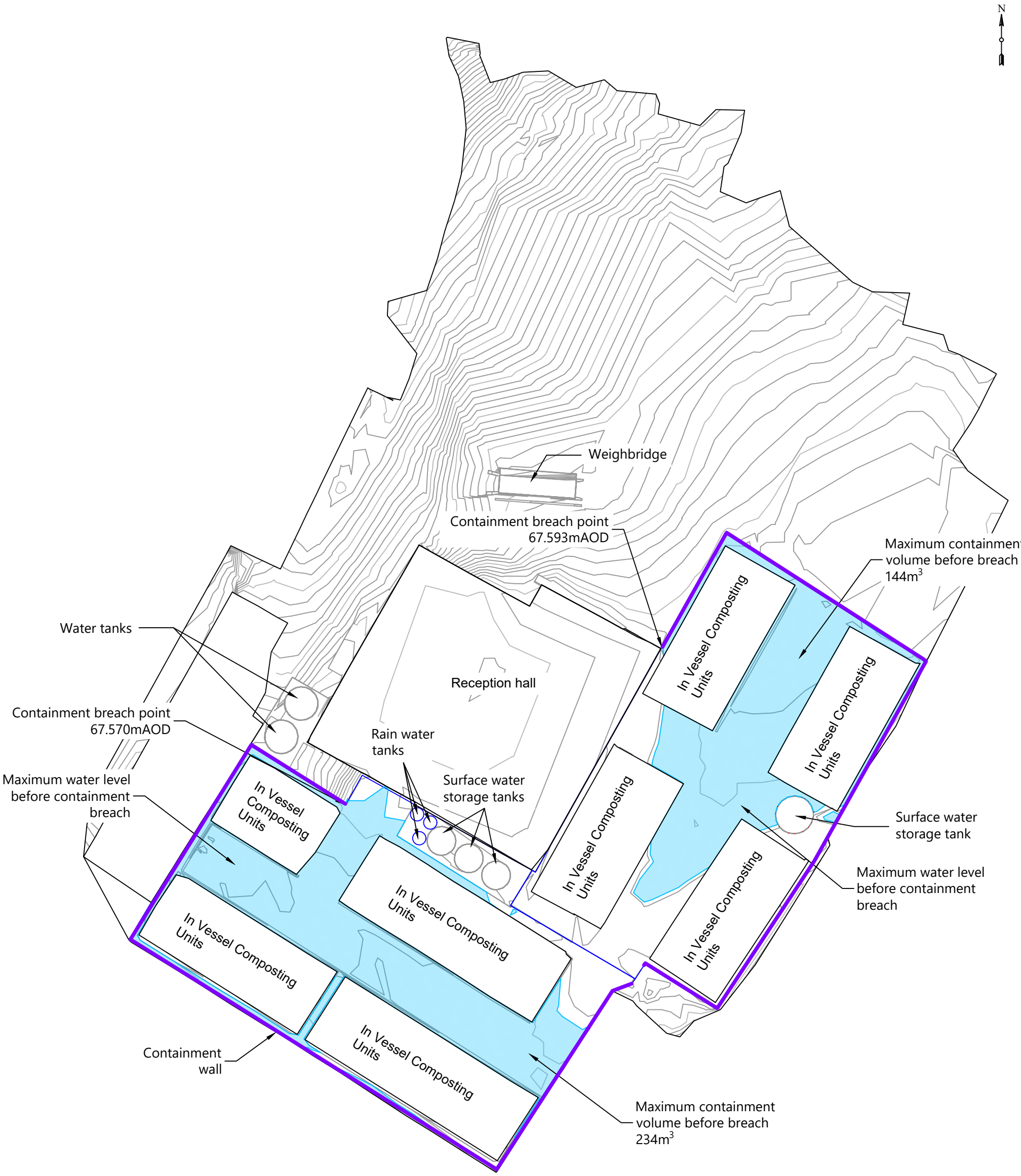
CLIENT: West London Composting Ltd	PROJECT TITLE: Spill Mapping & Containment System Capacity Modelling	DESIGNED RWS	DRAWN RWS
LOCATION: Newyears Green Ln, Harefield, Uxbridge UB9 6LX	TITLE: Southern site - Existing Layout	APPROVED DB	DATE 08/12/2020
NOTES		REVISIONS	

Rev	Date	Chkd	Description
0	08/12/2020	DB	First issue

CQA INTERNATIONAL LTD

DRAWING NUMBER	REV
30408/WLC/SM/3a	00

PROJECT NUMBER	SCALE @ A3
30408	1:750



CLIENT: West London Composting Ltd	PROJECT TITLE: Spill Mapping & Containment System Capacity Modelling	DESIGNED RWS	DRAWN RWS
LOCATION: Newyears Green Ln, Harefield, Uxbridge UB9 6LX	TITLE: Southern site - Spill Map (Existing conditions)	APPROVED DB	DATE 08/12/2020
NOTES		REVISIONS	

Rev	Date	Chkd	Description
0	08/12/2020	DB	First issue

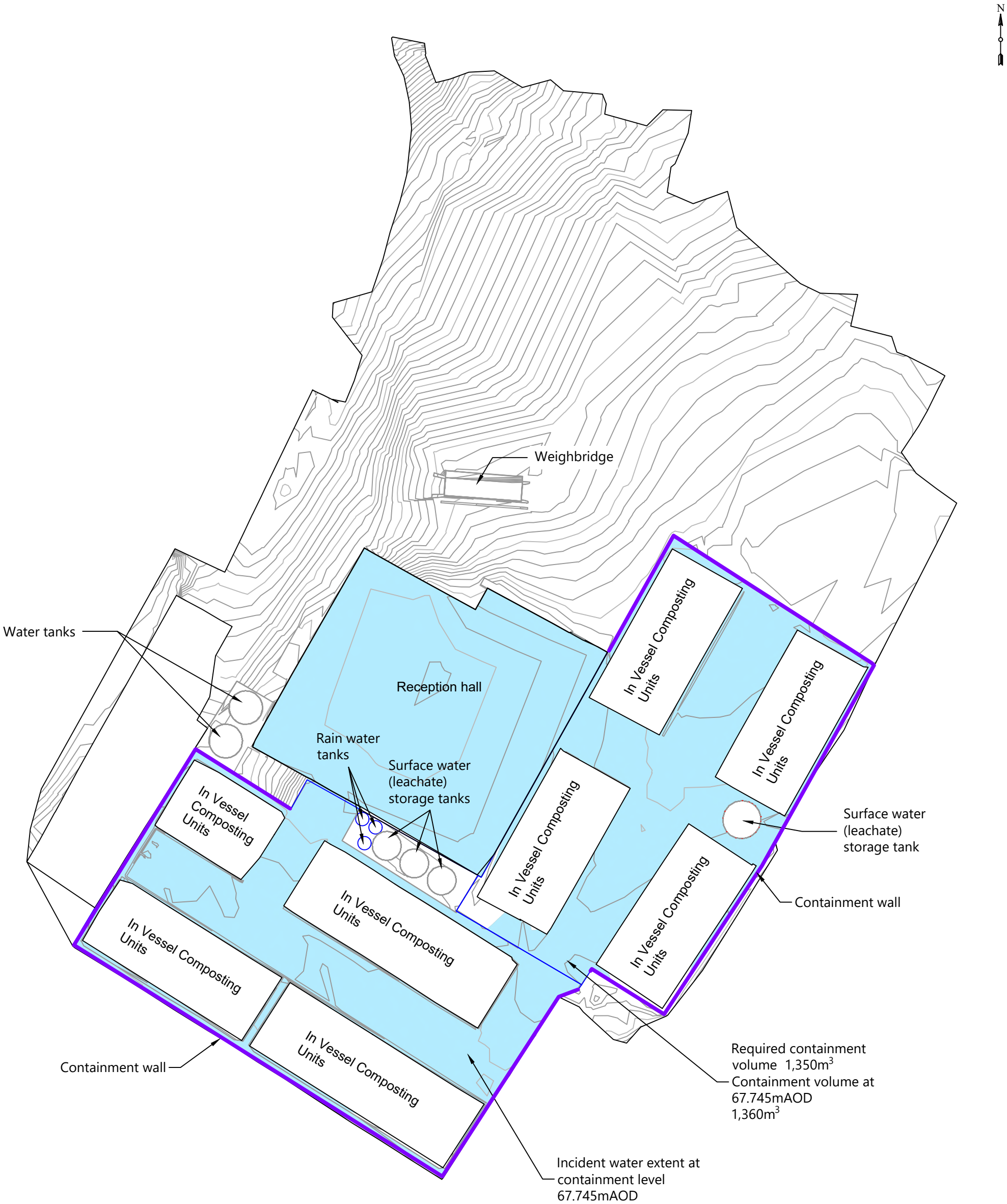
CQA INTERNATIONAL LTD

DRAWING NUMBER 30408/WLC/SM/3b

REV 00

PROJECT NUMBER 30408

SCALE @ A3 1:750



CLIENT: West London Composting Ltd	PROJECT TITLE: Spill Mapping & Containment System Capacity Modelling	DESIGNED RWS	DRAWN RWS
LOCATION: Newyears Green Ln, Harefield, Uxbridge UB9 6LX	TITLE: Southern site - Containment Model (required Conditions)	APPROVED DB	DATE 08/12/2020
NOTES		REVISIONS	

Rev	Date	Chkd	Description
0	08/12/2020	DB	First issue

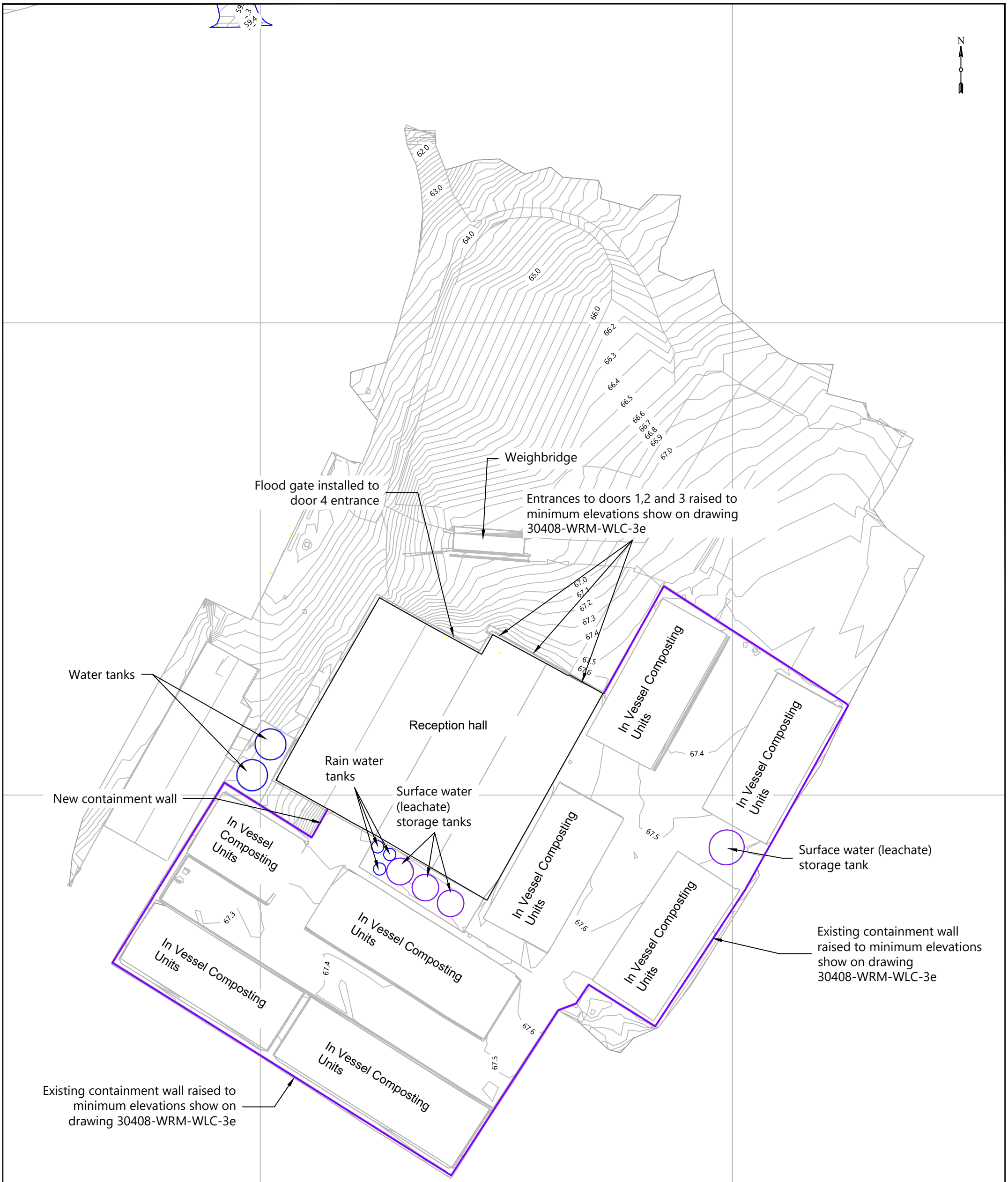
CQA INTERNATIONAL LTD

DRAWING NUMBER 30408/WRW/WLC/3c

REV 00

PROJECT NUMBER 30408

SCALE @ A3 1:750



CLIENT: West London Composting Ltd	PROJECT TITLE: Spill Mapping & Containment System Capacity Modelling	DESIGNED RWS	DRAWN RWS
		APPROVED DB	DATE 08/12/2020
LOCATION: Newyears Green Ln, Harefield, Uxbridge UB9 6LX	TITLE: Southern site - Required Containment Infrastructure	REVISIONS	
NOTES		0 | 08/12/2020 | DB | First issue	
		Rev | Date | Chkd | Description	

CQA INTERNATIONAL LTD

DRAWING NUMBER 30408/WLC/SM/3d

REV 00

PROJECT NUMBER 30408

SCALE @ A3 1:750

NOTES

LEGEND

67.754
0.041

Spot heights shown in green are for the required containment infrastructure These show:-

1. The upper value is the elevation of the existing containment wall or impermeable surface
2. The lower value is the amount the existing containment wall or surface has to be raised to provide containment for incident water
3. Where the lower value is a negative value the existing containment is of sufficient height
4. These heights are based on a minimum containment infrastructure elevation of 67.795

PROJECT TITLE

Spill Mapping & Containment System Capacity Modelling

PROJECT NUMBER

30408

CLIENT

West London Composting Ltd

LOCATION

Newyears Green Ln, Harefield, Uxbridge UB9 6LX

DRAWING TITLE

Additional heights required to be added to existing containment walls and surfaces

REVISIONS

Rev	Date	Chkd	Description
0	10/12/2020	DB	First issue

DESIGNED	RWS	DRAWN	RWS
SCALES @ A1	1:250	DATE	10/12/2020

CQA INTERNATIONAL LTD

DRAWING NUMBER	REV
30408/WLC/SM/03e	00