8th August 2023

West London Composting
High View Farm
Newyears Green Ln
Harefield
Newyears Green
Uxbridge UB9 6LX

Re: Pluviam Environmental PN0101 - Newyears Green Lane – Pluvial Flooding Review and Proposed Drainage Letter Report

Pluviam Environmental Ltd (PEL) have been asked to undertake a review to assess how the pluvial (surface water) flow pathways are affected by the proposed levels design and provide appropriate mitigation measures. PEL have also been requested to outline the onsite drainage and reuse strategy.

Pluvial Flow Pathways

Figure 1. Proposed site boundary with LiDAR data flow pathways

The existing LiDAR mapping used in ScalGo (pluvial flood modelling package), Figure 1, shows Flow Path 1 cutting from the mid-south of the site cutting across the southeast corner. The data shown in the model is somewhat incorrect as it fails to pick up the existing ditch which runs along the southern boundary where the flow path meets the site. However, this is unsurprising as the vegetation within the area is high compared to existing ground level. Photo 1 shows the ditch looking West to East towards the large mount seen in Figure 1 below.

The ditch flows the opposite direction to what is shown in the ScalGo model image. Photo 2 shows the existing ditch system being collected in a c.1m diameter culvert running below the existing composting site from East to West, where it ultimately outfalls to an unnamed watercourse.

Photo 1. Ditch looking west (outfall) to east

Photo 2. Culvert outfall c.1m diameter

The catchment area which falls to the existing ditch is shown in Figure 2. This catchment would not end up on the proposed development site as the ScalGo image suggests. The catchment would be collected in the ditch and culvert

system. The onsite catchment area draining to the ditch and culvert will be contained onsite with the new proposals which are to be discussed in the next section.

Flow Path 2 is inherent to site and will be collected as part of the proposed water reuse system. This will be discussed in the section detailing the drainage and water reuse proposals.

Figure 2. Shows the catchment area served by the flow pathway

Proposed Site Levels and Flow Pathways

The proposed cut and fill model for the site and the existing ditch have been modelled into the ScalGo Pluvial analysis software as shown in Figure 3.

The model shows a net reduction of flooded areas when comparing Figures 1 and 3. This is due to the presence of the existing ditch to the South being input and the effect of the proposed site containment clay lined bund. The bund surrounding the site is approximately 3m high..

Figure 3 also shows a 500mm pluvial deluge on the site which shows no offsite flooding and storage for over 22,900m^3 of volume.

The ditch to the south is to be cleared of vegetation and debris and remediated along with the culvert inlet as part of the development. West London Composting own the land on which the ditch sits and have riparian ownership.

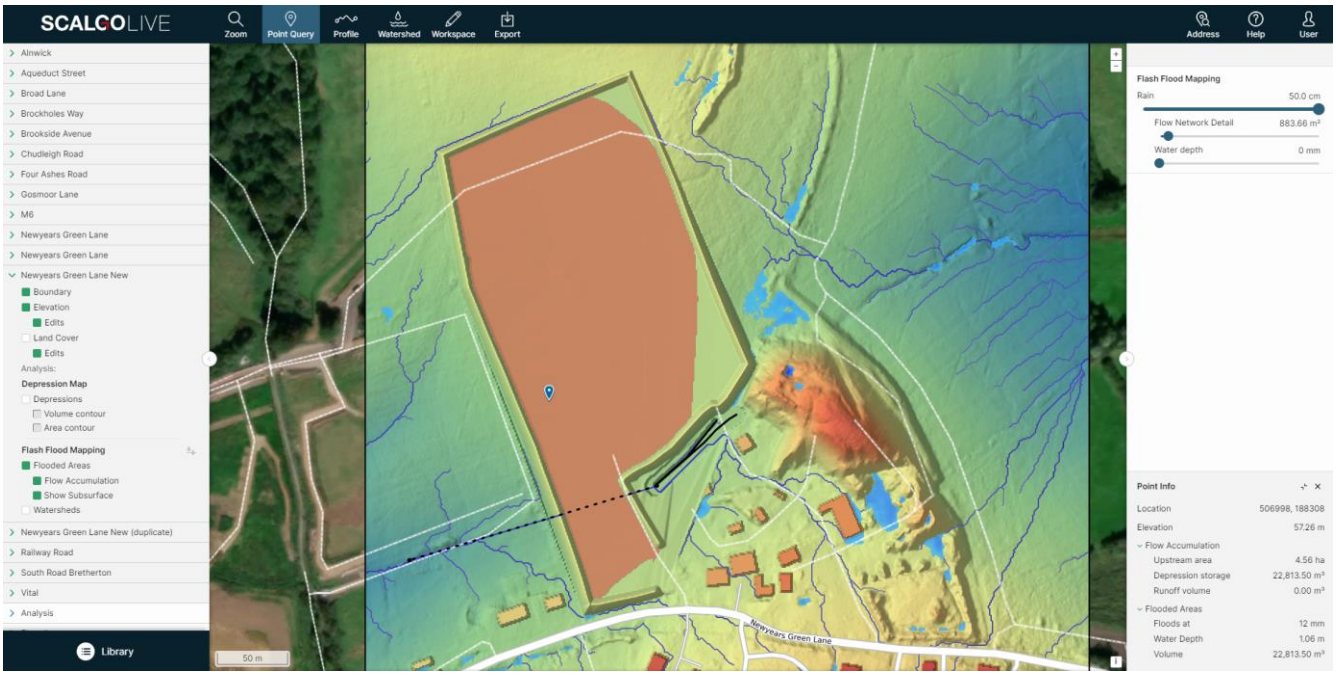


Figure 3. Proposed model with existing ditch to South

Figure 4 & 5 show sections through the ditch and proposed clay lined bund.

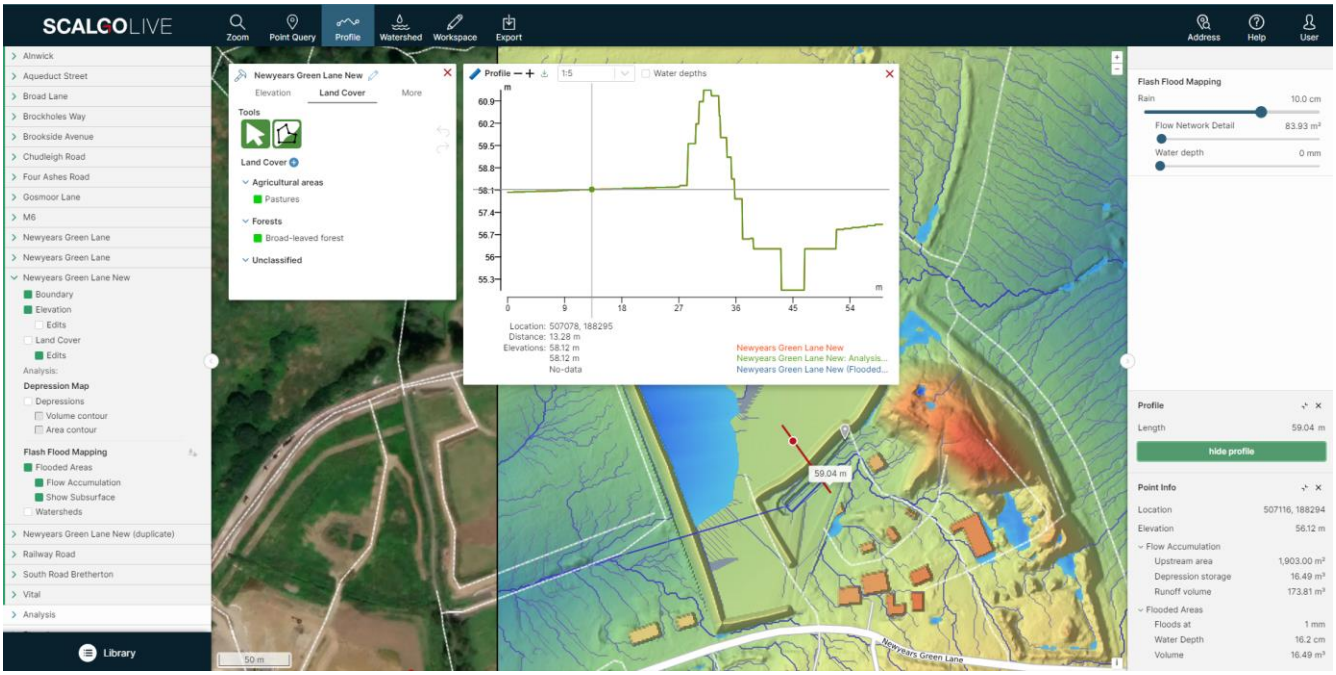


Figure 4. Section of proposed bund and existing ditch

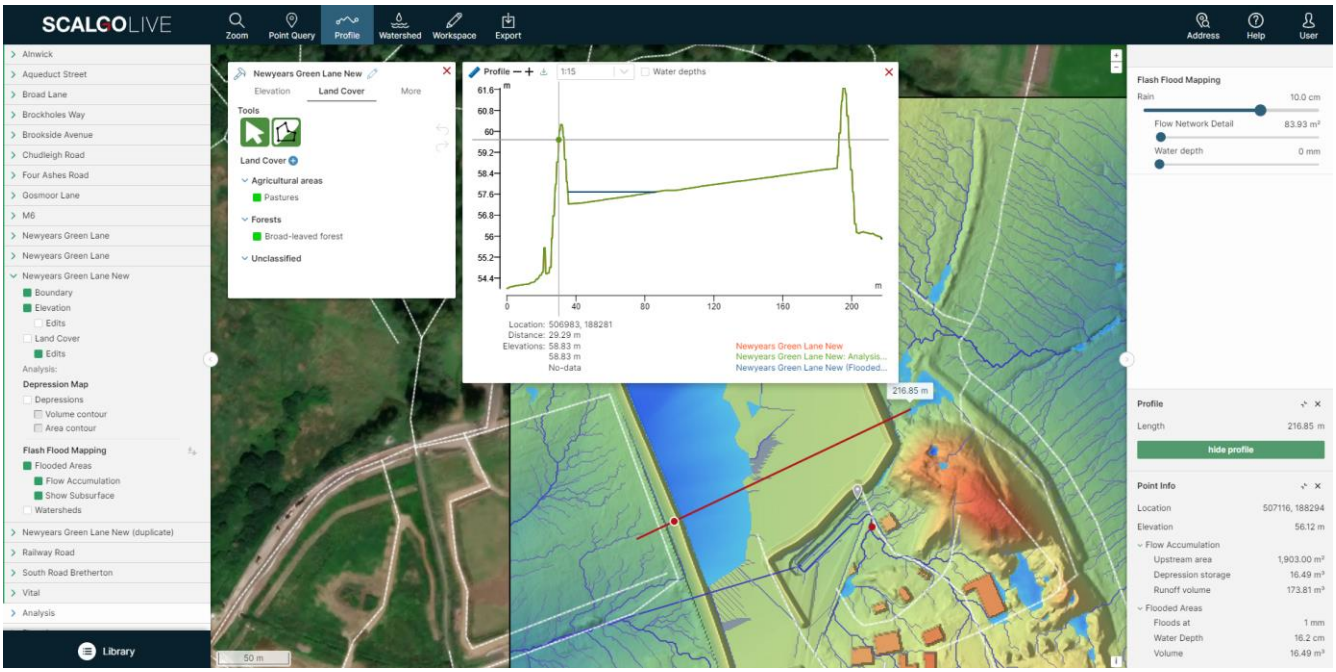


Figure 5. Section across the development West to East

Considering the presence of the existing ditch and proposed bund, catchment to flow paths will be reduced and the flow path to the south is maintained.

Proposed Drainage and Reuse
The proposed site plan and existing/proposed drainage is shown below in Figure 6 (a full size copy is enclosed).

It should be noted that the site is a waste operation working under an Environmental Permit issued under the Environmental Permitting Regulations (2016) Section 5.4 Part A(1)(b)(i) - Disposal, recovery or a mix of disposal and recovery of non-hazardous waste involving biological treatment. Our permit, issued under these regulations, does not allow us to discharge any water into surface water OR groundwater. All water which falls upon the site is collected for reuse within the composting process.

West London Composting are net importers of water due to the high demand of water in the composting process. The evapotranspiration rates are much higher than the typical 5mm/day due to the heat generated by the process.

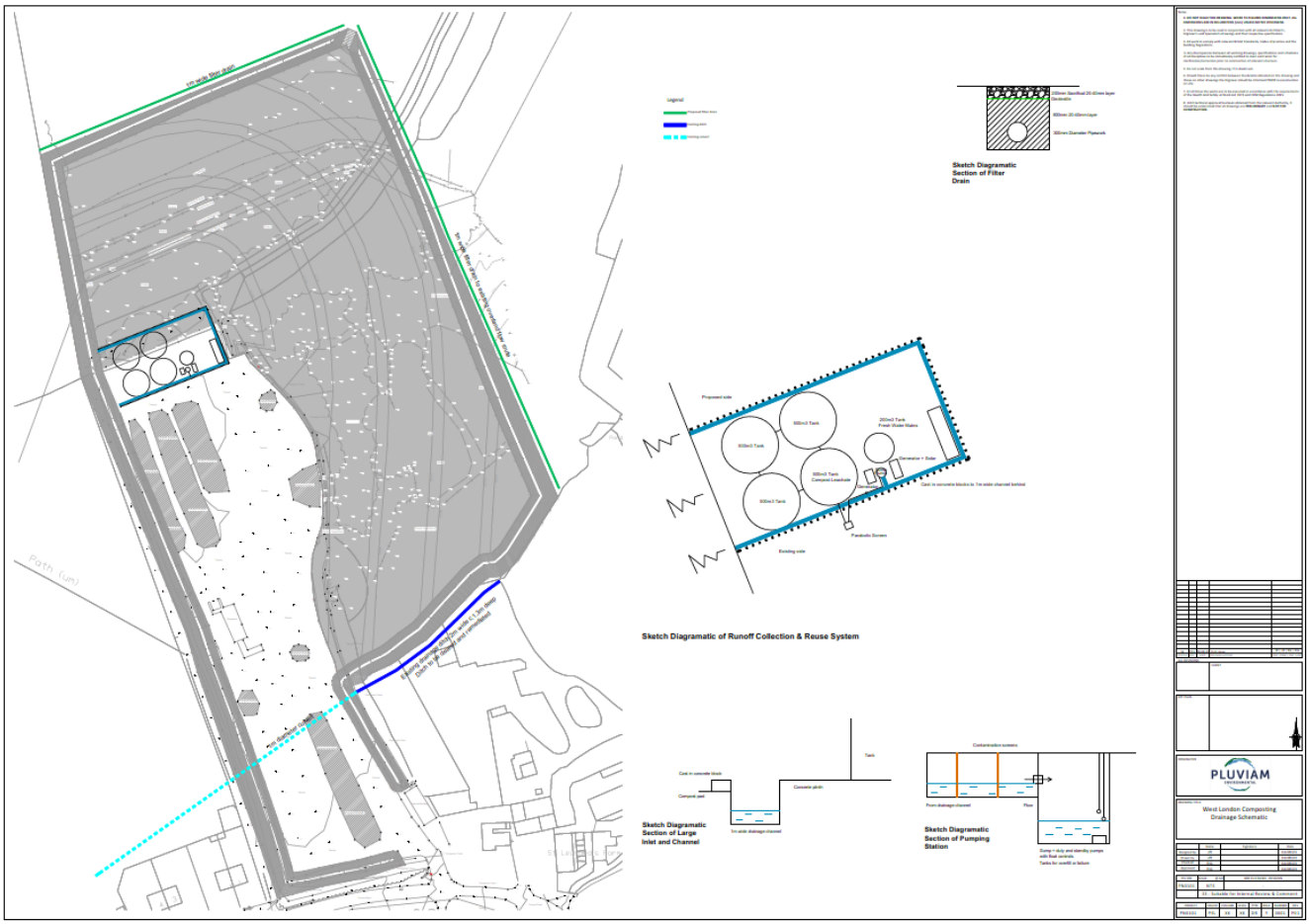


Figure 6. Proposed reuse and drainage plan

PEL have analysed the proposed 1in100+40% climate change storm (see Figure 7 for climate percentage allowances) using Causeway design software. Based on the 4.4 ha site area, approximately 5479m^3 of volume is generated with no discharge off site. See the enclosed calculations.

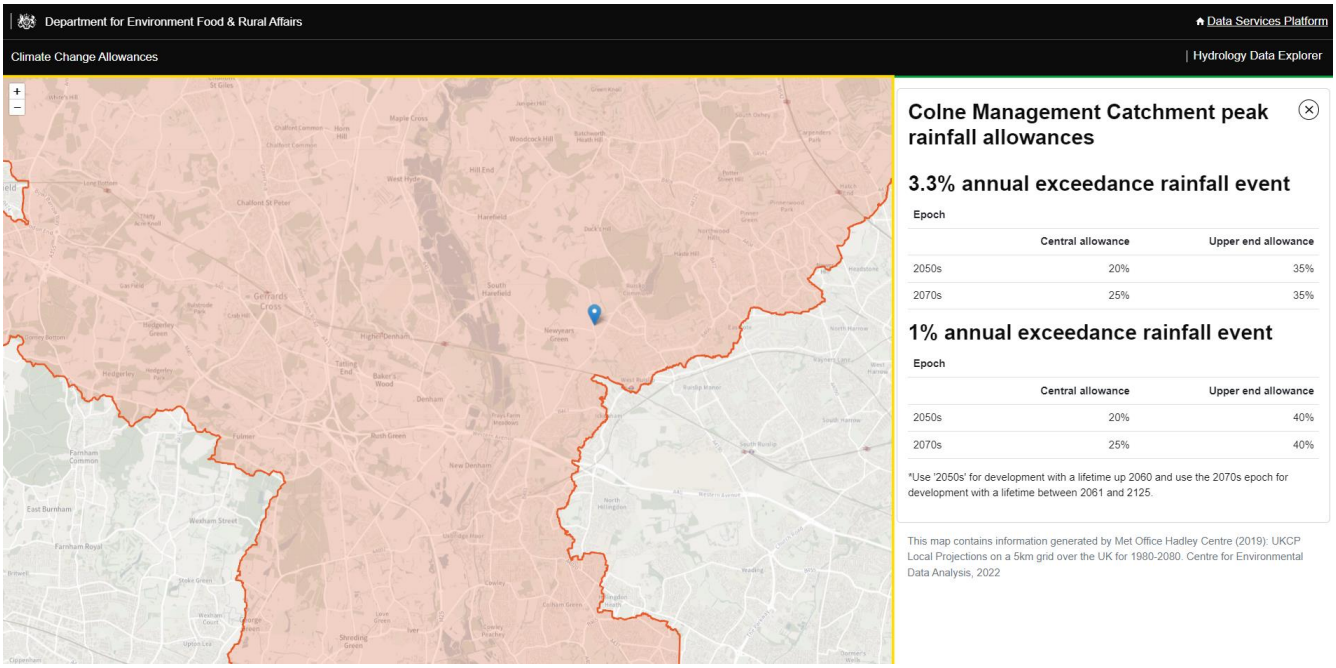


Figure 7. Climate change allowance

West London Composting have confirmed that they use on average 48,750m^3 of recovered water per year as part of the composting process. Therefore, a single 1in100+40% event would be utilised for composting operations.

The site is water compatible and any water within the bund area will be stored for re-use. PEL have run a 500mm pluvial deluge event (Figure 3) and the output shows that c.22,900m^3 of water is generated with no flooding offsite.

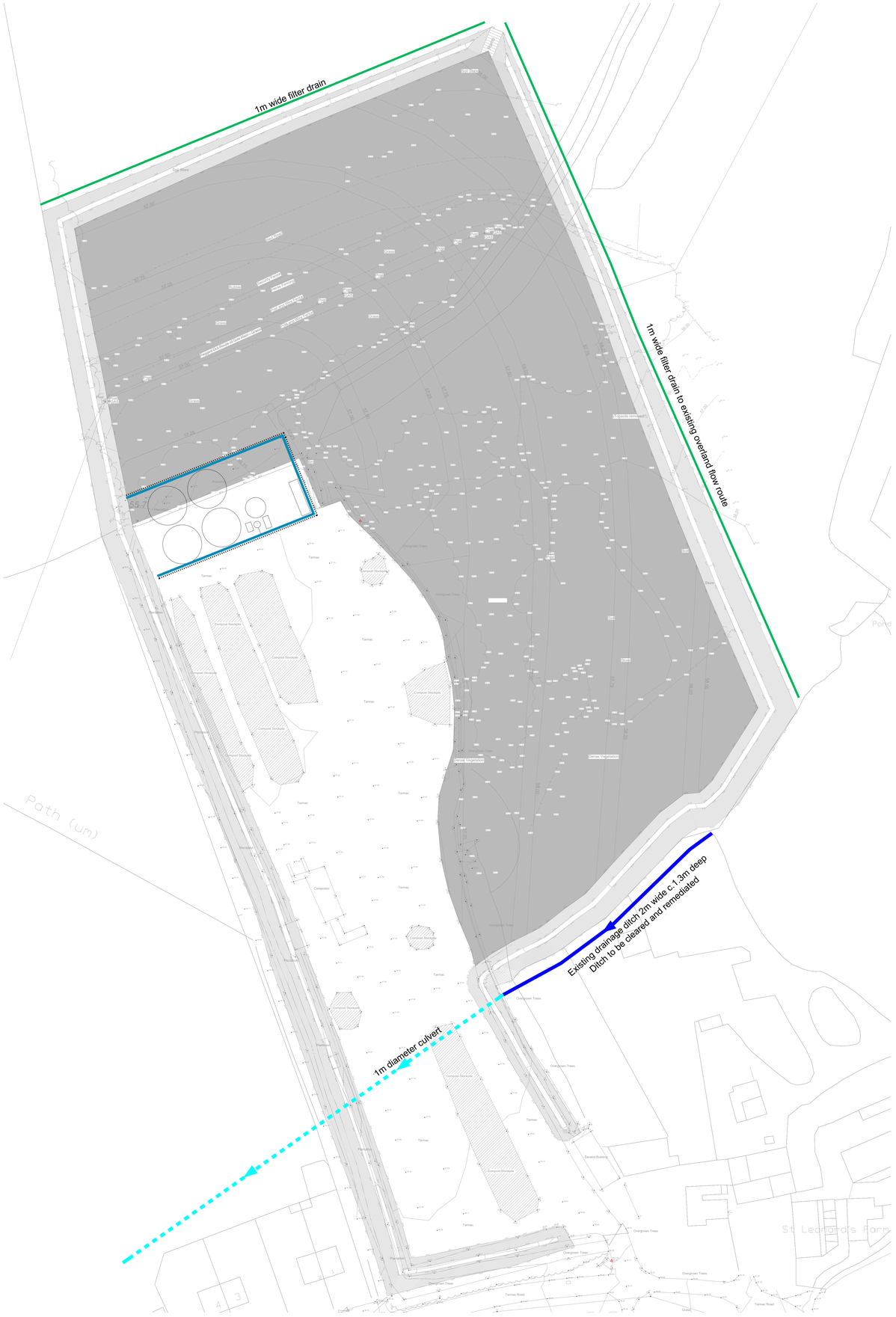
The proposed site shall fall to a central area which contains a 1m wide concrete drainage channel with large hit and miss blocks to prevent large sediment entry, as shown in Figure 6. The drainage channel acts as a silt trap prior to allowing any runoff into the pumping station with duty and standby pumps. The pumping station discharges to parabolic screens and ultimately 4 no. 500m^3 water harvesting tanks to allow for the water to be reused in the composting operation.

No overflow is suggested as discharge of any water would result in contravening the permit which would be enforceable by the Environment Agency.

The site has a robust maintenance regime to prevent excess silts accumulating in the existing channels. Likewise, the site falls allow for runoff to directly be intercepted. The proposals effectively more than double the water storage tanks and the 3m tall lined bund prevents any offsite runoff.

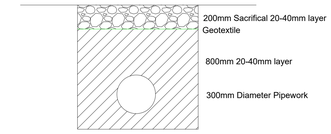
Yours faithfully,

John Roberts
Director
For and on behalf of
Pluviam Environmental Ltd
encl.

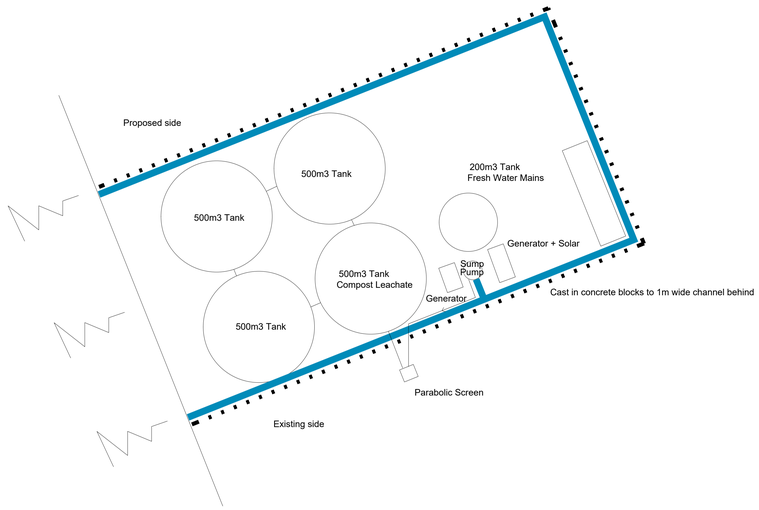


Legend

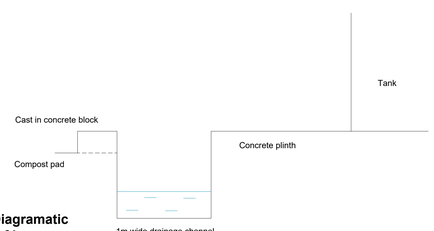
- Proposed filter drain
- Existing ditch
- Existing culvert



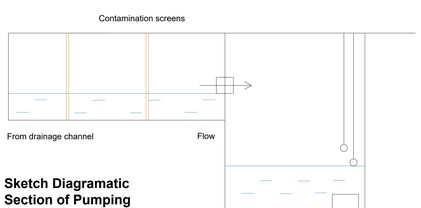
Sketch Diagramatic Section of Filter Drain



Sketch Diagramatic of Runoff Collection & Reuse System



Sketch Diagramatic Section of Large Inlet and Channel



Sketch Diagramatic Section of Pumping Station

Notes.

1. DO NOT SCALE THIS DRAWING. WORK TO FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS NOTED OTHERWISE.

2. This drawing is to be read in conjunction with all relevant Architect's, Engineer's and Specialist's drawings and their respective specification.

3. All work to comply with relevant British Standards, Codes of practice and the Building Regulations.

4. Any discrepancies between all working drawings, specifications and schedules of all disciplines to be immediately notified to main contractor for clarification/correction prior to construction of relevant structure.

5. Do not scale from this drawing. If in doubt ask.

6. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.

7. At all times the works are to be executed in accordance with the requirements of the Health And Safety at Work Act 1974 and CDM Regulations 2015.

8. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings are **PRELIMINARY** and **NOT FOR CONSTRUCTION**.

STATUS	REV	DATE	REVISION HISTORY	DSG | DRW | CHK | APP
S3	P01	08.08.23	First issue	JR | JR | RG | RG

ALL REVISIONS

CLIENT

KEY PLAN

ORIGINATOR

PLUVIAM ENVIRONMENTAL

DRAWING TITLE

West London Composting
Drainage Schematic

	Name	Signature	Date
Designed by	JR		04/08/23
Drawn by	JR		04/08/23
Checked	RG		04/08/23
Approved	RG		04/08/23

PEL REF	SCALE @ A0	BIM FILE NAME - REVISION
PN0101	NTS	-
	S3 - Suitable for Internal Review & Comment	

PROJECT	ISSUER	VOLUME	LEVEL	TYPE	ROLE	NUMBER	REV
PN0101	PEL	XX	XX	DR	Y	0001	P01

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)		Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)		Minimum Backdrop Height (m)	0.200
Ratio-R		Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)		Enforce best practice design rules	✓

Nodes

Name	Area (ha)	Cover Level (m)	Easting (m)	Northing (m)	Depth (m)
Depth/Area 1	4.400	100.000	3.356	90.970	0.500

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
10	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Node Depth/Area 1 Online Pump Control

Flap Valve	x	Invert Level (m)	99.500	Switch off depth (m)	0.000
Replaces Downstream Link	✓	Switch on depth (m)	0.100		

Depth (m)	Flow (l/s)
0.100	0.000

Node Depth/Area 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	99.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	20000.0	0.0	0.500	20000.0	0.0	0.501	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Depth/Area 1	1470	99.565	0.065	38.1	1312.8250	0.0000	OK

Link Event (Outflow)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
15 minute summer	Depth/Area 1	Pump	0.0	0.0

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Depth/Area 1	1470	99.607	0.107	62.8	2162.4220	0.0000	OK

Link Event (Outflow)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
15 minute summer	Depth/Area 1	Pump	0.0	0.0

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Depth/Area 1	1470	99.638	0.138	81.2	2793.5910	0.0000	OK

Link Event (Outflow)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
15 minute summer	Depth/Area 1	Pump	0.0	0.0

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Depth/Area 1	1470	99.694	0.194	113.7	3915.0770	0.0000	OK

Link Event (Outflow)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
15 minute summer	Depth/Area 1	Pump	0.0	0.0

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Depth/Area 1	1470	99.772	0.272	159.2	5479.9010	0.0000	OK

Link Event (Outflow)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
15 minute summer	Depth/Area 1	Pump	0.0	0.0