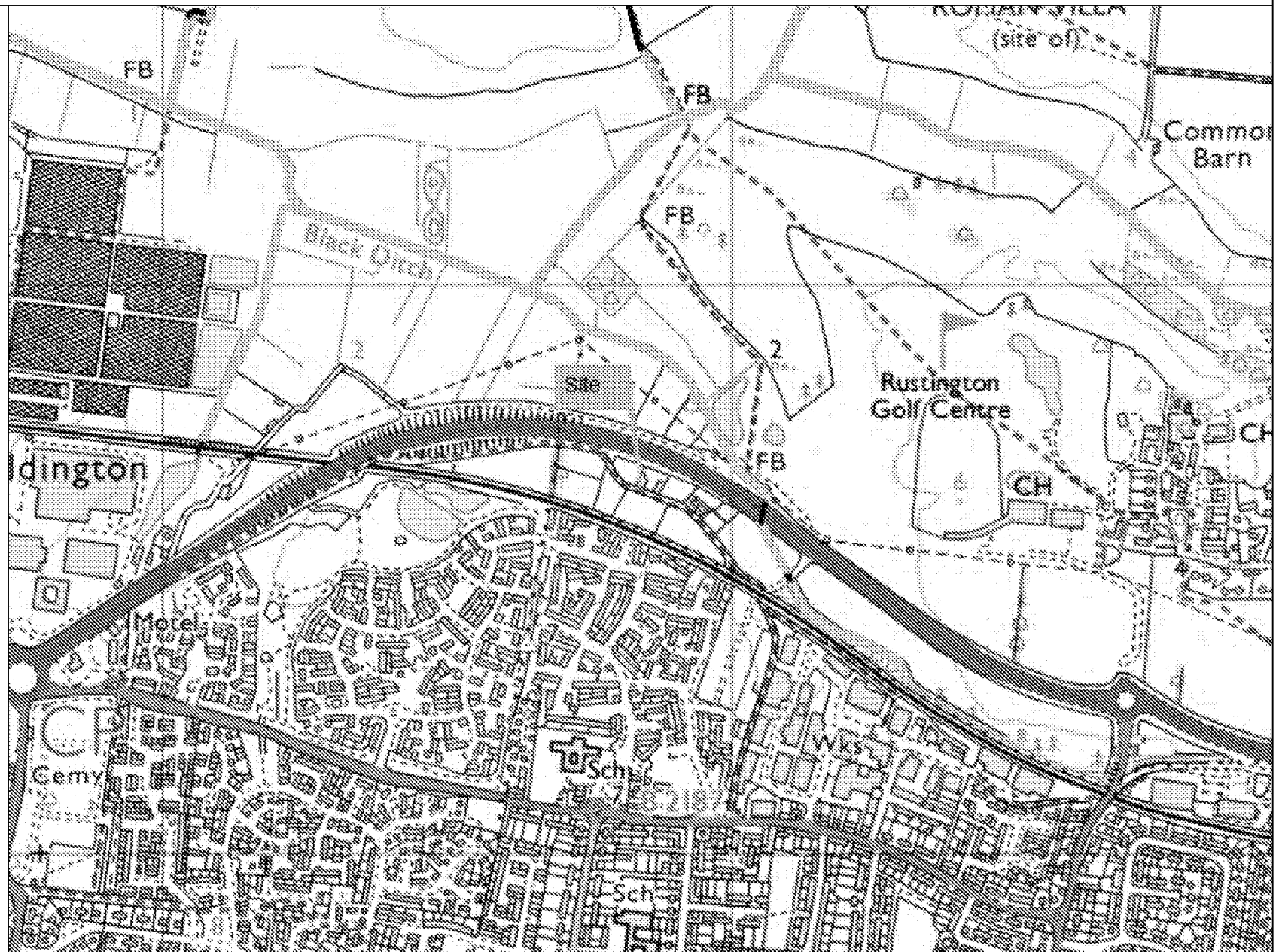


Flood Defence Locations. Centred BN16 3JL. Created 20/02/2017.

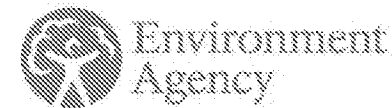
Legend

Defences

- Embankment
- Wall
- Flood Gate
- Demountable Defence
- Bridge Abutment
- High Ground
- Beach
- Barrier Beach
- Promenade
- Quay
- Cliff
- Dunes
- Culvert



Flood Map for Planning (Rivers and Sea). Centred BN16 3JL. Created 20/02/2017.



Scale 1: 10,000



Flood Map for Planning (Rivers & Sea)

- Defences
- Flood Storage Areas
- Areas benefiting from flood defences
- Flood Zone 3
- Flood Zone 2

Flood Map Areas (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

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Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Product 4 Flood Risk Data Requested by: Maria Orellana
Site: Brook Lane, Rustington, Littlehampton BN16 3JL

Table 1: Water Levels: Fluvial Undefended

Node Reference	NGR		Modelled Flood Levels in Metres			
	Eastings	Northings	Undefended Annual Exceedance Probability			
			5%	1%	1% Plus Climate Change	0.1%
1	504877	103622	-	-	-	-
2	504962	103593	-	-	-	-
3	505020	103564	-	-	1.63	-
4	505052	103508	-	-	-	-

Table 2: Water Levels: Fluvial Defended

Node Reference	NGR		Modelled Flood Levels in Metres					
	Eastings	Northings	Defended Annual Exceedance Probability					
			20%	5%	1.3%	1%	1% + CC	0.1%
1	504877	103622	-	-	-	-	-	-
2	504962	103593	-	-	-	-	-	-
3	505020	103564	-	-	-	-	-	-
4	505052	103508	-	-	-	-	-	-

Table 3: Water Levels: Tidal Undefended

Node Reference	NGR		Modelled Flood Levels in Metres			
	Eastings	Northings	Undefended Annual Exceedance Probability			
			5%	0.5%	0.5% (2110)	0.1%
1	504877	103622	-	-	-	-
2	504962	103593	-	-	-	-
3	505020	103564	-	-	1.96	-
4	505052	103508	-	-	1.96	-

Table 4: Water Levels: Tidal Defended

Node Reference	NGR		Modelled Flood Levels in Metres			
	Eastings	Northings	Defended Annual Exceedance Probability			
			5%	0.5%	0.5% (2110)	0.1%
1	504877	103622	-	-	-	-
2	504962	103593	-	-	2.74	-
3	505020	103564	-	-	2.74	-
4	505052	103508	-	-	2.74	-

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www.gov.uk/government/organisations/environment-agency

Table 5: Water Depth: Fluvial Undefended

Node Reference	NGR		Modelled Flood Depth in Metres			
	Eastings	Northings	Undefended Annual Exceedance Probability			
			5%	1%	1% Plus Climate Change	0.1%
1	504877	103622	-	-	-	-
2	504962	103593	-	-	-	-
3	505020	103564	-	-	0.03	-
4	505052	103508	-	-	-	-

Table 6: Water Depth: Fluvial Defended

Node Reference	NGR		Modelled Flood Depth in Metres					
	Eastings	Northings	Defended Annual Exceedance Probability					
			20%	5%	1.3%	1%	1% + CC	0.1%
1	504877	103622	-	-	-	-	-	-
2	504962	103593	-	-	-	-	-	-
3	505020	103564	-	-	-	-	-	-
4	505052	103508	-	-	-	-	-	-

Table 7: Water Depth: Tidal Undefended

Node Reference	NGR		Modelled Flood Depth in Metres			
	Eastings	Northings	Undefended Annual Exceedance Probability			
			5%	0.5%	0.5% (2110)	0.1%
1	504877	103622	-	-	-	-
2	504962	103593	-	-	-	-
3	505020	103564	-	-	0.33	-
4	505052	103508	-	-	0.28	-

Table 8: Water Depth: Tidal Defended

Node Reference	NGR		Modelled Flood Depth in Metres			
	Eastings	Northings	Defended Annual Exceedance Probability			
			5%	0.5%	0.5% (2110)	0.1%
1	504877	103622	-	-	-	-
2	504962	103593	-	-	0.17	-
3	505020	103564	-	-	1.14	-
4	505052	103508	-	-	1.09	-

All levels taken from: Lower Tidal River Arun Strategy Study, completed in 2010 by Atkins.

There is no additional information or health warnings for these levels/depths or the model from which they have been produced.

Produced on 20/02/2017

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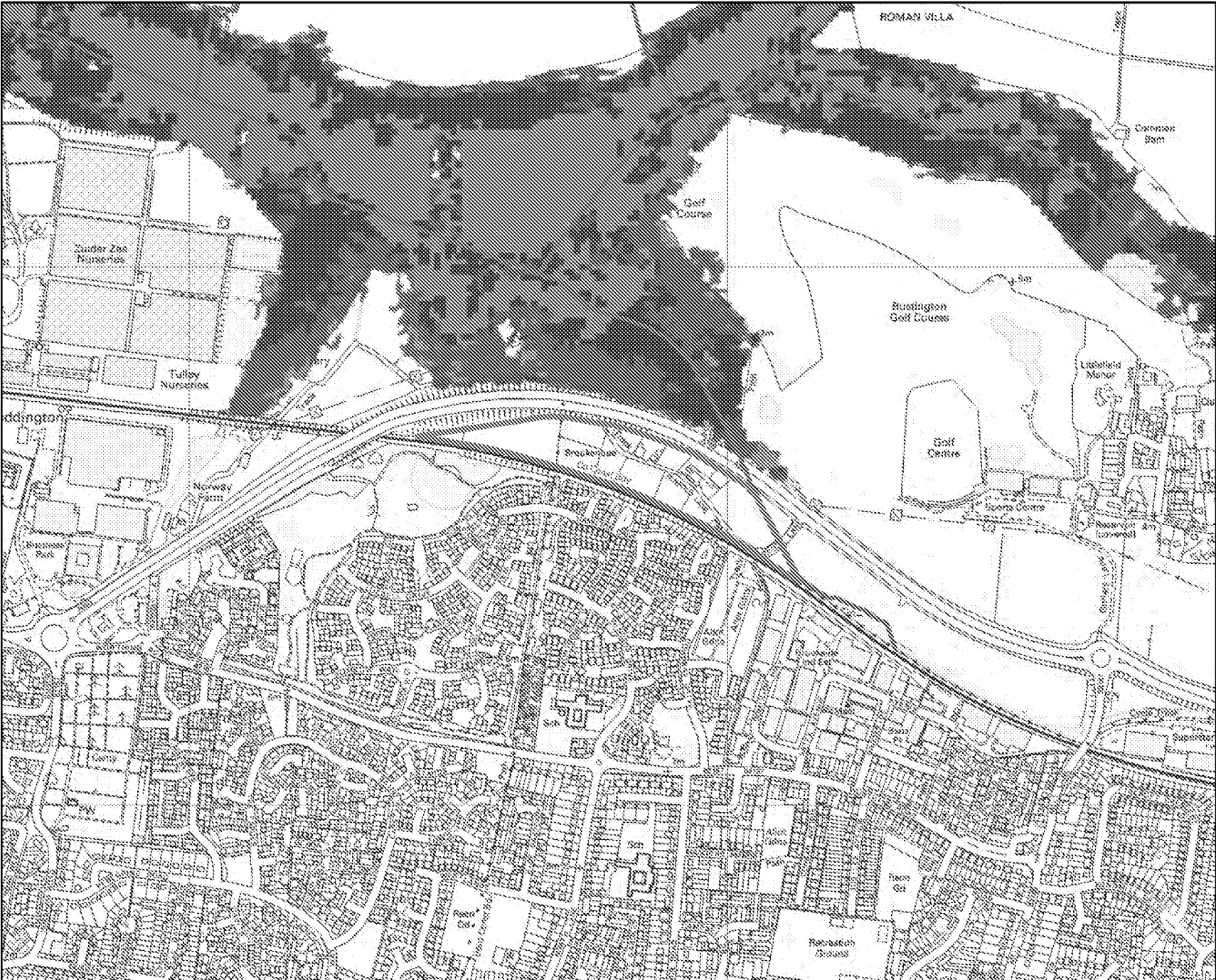
Legend

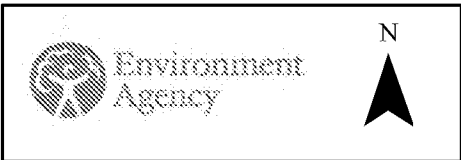
- Site Boundary
- Main River
- 20% AEP (Defended Fluvial)
- 5% AEP (Defended Fluvial)
- 1.3% AEP (Defended Fluvial)
- 1% AEP (Defended Fluvial)
- 0.1% AEP (Defended Fluvial)
- 1% AEP Plus Climate Change (Defended Fluvial)

Scale: 1:10,000

00.1250.25

Kilometers

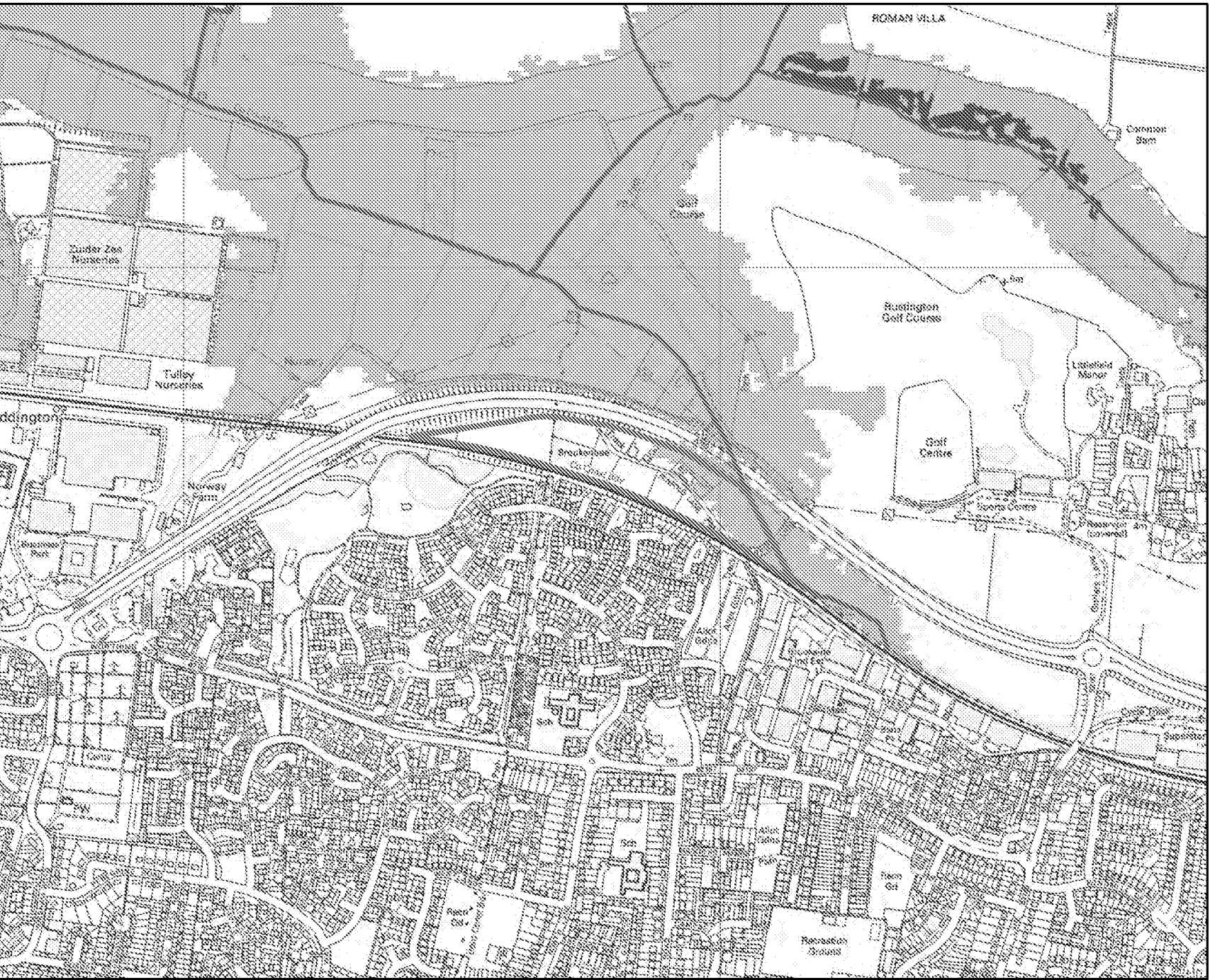
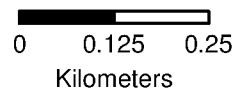


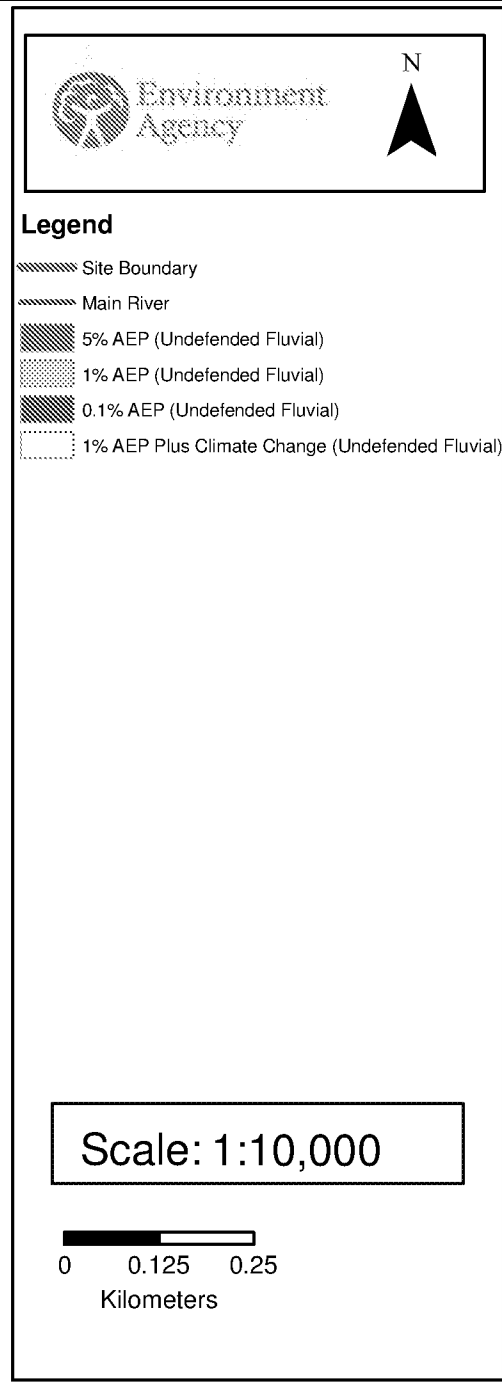


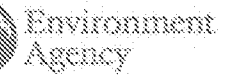
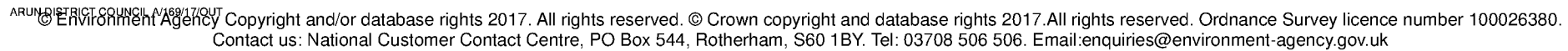
Legend

- Site Boundary
- Main River
- 5% AEP (Defended Tidal)
- 0.5% AEP (Defended Tidal)
- 0.1% AEP (Defended Tidal)
- 0.5% AEP (2110) (Defended Tidal)

Scale: 1:10,000







 Site Boundary
 Main River
 5% AEP (Un defended Tidal)
 0.5% AEP (Un defended Tidal)
 0.1% AEP (Un defended Tidal)
 0.5% AEP (2110) (Un defended Tidal)

A horizontal scale bar with a black segment on the left and a white segment on the right. Below the bar are the numbers 0, 0.125, and 0.25. Below these numbers is the word "Kilometers".



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Legend

 Site Nodes

 Site Boundary

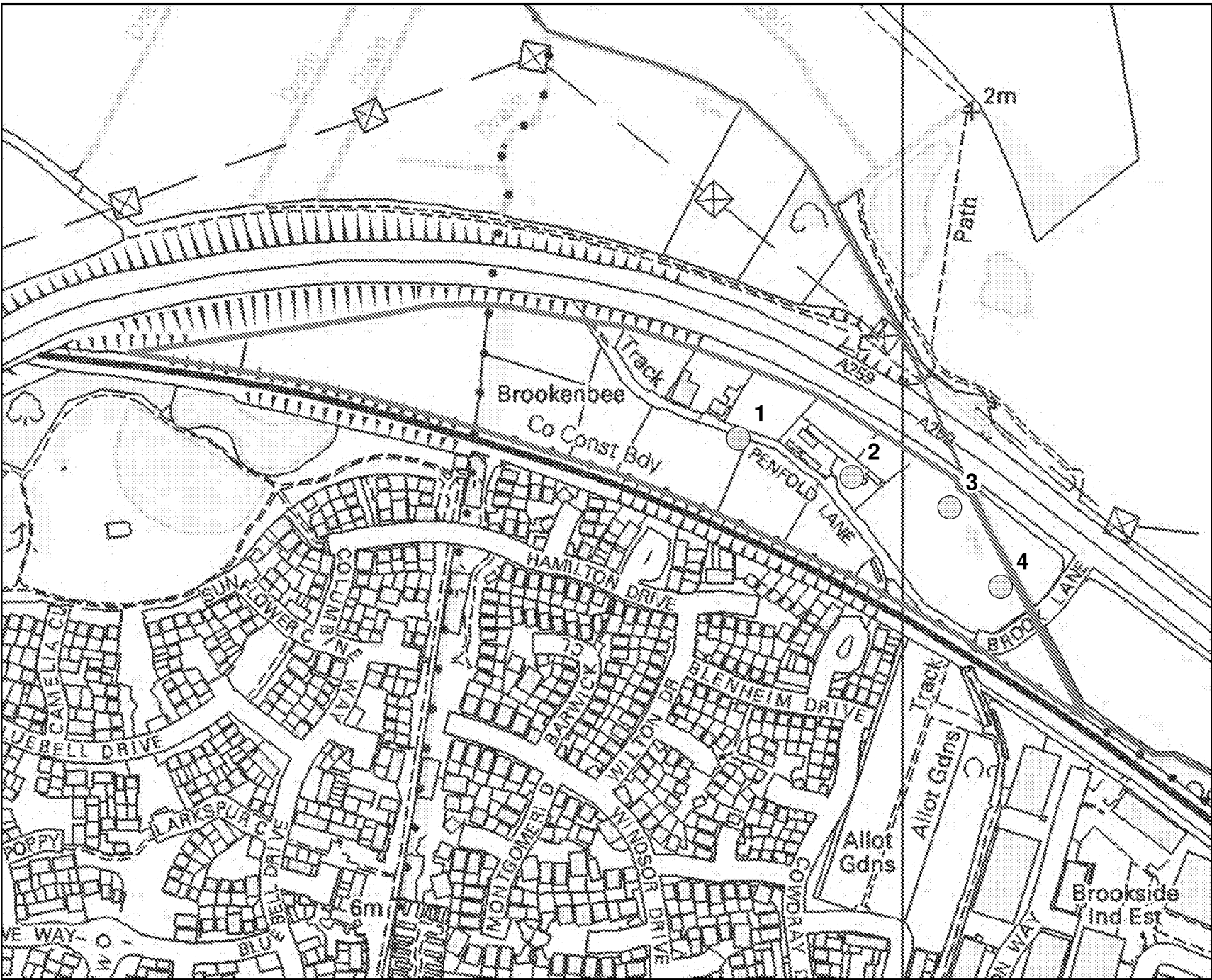
 Main River

Scale: 1:4,000



0 0.05 0.1

Kilometers



AUDITREPORT.TXT

Volumes of PGM2 model relative to PGM1 model

PGM1 (Existing) model:

N:\JOBS\A3750_A3999\A3992\CALCULATIONS\PDS\FINAL\PGM\EXISTING.DGM

PGM2 (Proposed) model: Datum plane at level: 2.740

Zones of PGM1 included in volume calcs:

All zones

Zones of PGM2 included in volume calcs:

All zones

Volumes were calculated within a digitised boundary

Areas and Perimeters of PGM1:

Zone No.	Surface Area (sq.m.)	Plan Area (sq.m.)	Perimeters Internal (m.)	Perimeters External (m.)
1 Zone 1	68090.0	67903.3	0.0	1713.3
Totals:	68090.0	67903.3		1713.3

Areas and Perimeters of PGM2:

Zone No.	Surface Area (sq.m.)	Plan Area (sq.m.)	Perimeters Internal (m.)	Perimeters External (m.)
1 Zone 1	252972.8	252972.8	0.0	2164.1
Totals:	252972.8	252972.8		2164.1

Total Plan and Surface Areas of Overlap between both PGM models:

	In Cut	In Fill	Balanced
Total Plan Area:	244.6	15065.8	0.0
Total Surface Area:	245.2	15113.5	0.0

Total of Cut and Fill Volumes listed by zones of PGM1:

Zone No.	Volumes		Nett Volumes	
	Cut (cu.m.)	Fill (cu.m.)	Cut (cu.m.)	Fill (cu.m.)
1 Zone 1	19.6	8580.8		8561.2
Total Volumes:	Gross: 19.6	8580.8		
	Nett: 8561.2			

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Note:

Volumes are of PGM2 surface relative to PGM1 formation

Summary of Total Volumes of Cut/Fill:

		PGM2 surface relative to PGM1 surface	
		Cut	Fill
Total	Gross:	19.6	8580.8
	Nett:		8561.2

CTP Engineers		Page 1
Suffolk House 154 High Street Sevenoaks TN13 1XE	A3992 Brook Lane Rustington	
Date 22/02/2017 12:29 File	Designed by MOM Checked by	
XP Solutions Source Control 2016.1		

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.400
Area (ha)	1.800	Urban	0.000
SAAR (mm)	721	Region Number	Region 7

Results l/s

QBAR Rural	6.3
QBAR Urban	6.3
Q1 year	5.4
Q1 year	5.4
Q30 years	14.4
Q100 years	20.2

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CTP Engineers		Page 1
Suffolk House 154 High Street Sevenoaks TN13 1XE	A3992 Brook Lane Rustington	
Date 22/02/2017 12:26 File	Designed by MOM Checked by	
XP Solutions Source Control 2016.1		

Greenfield Runoff Volume

FSR Data

Return Period (years)	100
Storm Duration (mins)	360
Region	England and Wales
M5-60 (mm)	19.000
Ratio R	0.350
Areal Reduction Factor	1.00
Area (ha)	1.800
SAAR (mm)	721
CWI	107.710
Urban	0.000
SPR	37.000

Results

Percentage Runoff (%)	36.72
Greenfield Runoff Volume (m ³)	416.598

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Title: Brook Lane, Rustington

Job No. A3992
By MOM
Date: 03.03.2017
Sheet No. 1 of 2



Suffolk House, 154 High St,
Sevenoaks, Kent, TN13 1XE
Telephone: 01732 740 195
Facsimile: 01732 740 662
www.ctp-llp.com

Description:
Estimate of unmitigated peak rate and volume of run-off
from proposed development
(Including allowance for climate change)

Ref:	Calculations	Output
	Proposed Development Proposed Development: Estimate of Surface Water Run-Off using the Modified Rational Method Catchment Area = 59210 m² Proposed Impermeable Area = 12360 m² <u>Average Rate of Rainfall:</u> Average rainfall values from Micro-Drainage using: FSR method where: M5-60(mm)= 19.000 R, ratio= 0.350 1 Year 15 Minute Event (M1-15D) = 28.1 mm/hr 30 Year 15 Minute Event (M30-15D)= 68.8 mm/hr 100 Year Event 15 Minute Event (M100-15D)= 89.0 mm/hr <u>Peak Rate of Run-Off (+ climate change allowance)</u> $Q_p = C \cdot A_p \cdot I$ (+30% allowance for climate change) , where $C = C_v \cdot C_r$ $C_v = 0.75$ (Volumetric run-off co-efficient) $C_r = 1.30$ (Routing co-efficient) Allowance for climate change 40% $Q_{p1+CC} = 131.7$ l/s $Q_{p30+CC} = 322.6$ l/s $Q_{p100+CC} = 417.2$ l/s	

Title: Brook Lane, Rustington

Job No. A3992
By MOM
Date: 03.03.2017
Sheet No. 2 of 2



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Sevenoaks, Kent, TN13 1XE
Telephone: 01732 740 195
Facsimile: 01732 740 662
www.ctp-llp.com

Description:
Estimate of unmitigated peak rate and volume of run-off
from proposed development
(Including allowance for climate change)

Ref:	Calculations	Output
	Volume of Run-Off (M100-360D) (+ climate change allowance) This is calculated using the 100 Year return period, 360 minute storm event <u>Average Rate of Rainfall:</u> 100 Year 360 Minute Event (M100-360D) = 10.505 mm/hr (Rain intensity taken from Microdrainage WinDes using FSR method) <u>Proposed Volume of Run-Off for 6 hour storm duration +Climate Change</u> Allowance for climate change = 40% Average rainfall (M100-360D) +CC% = 14.707 mm/hr (i) Average depth of rainfall +30% (6h) = 88.242 mm Volume = $C \cdot A_p \cdot i \cdot t$ Where $C = C_v \cdot C_r$ $C_v = 0.75$ (Volumetric Co-efficient) $C_r = 1.30$ (Routing Co-efficient) $V = 1063.4 \text{ m}^3$	