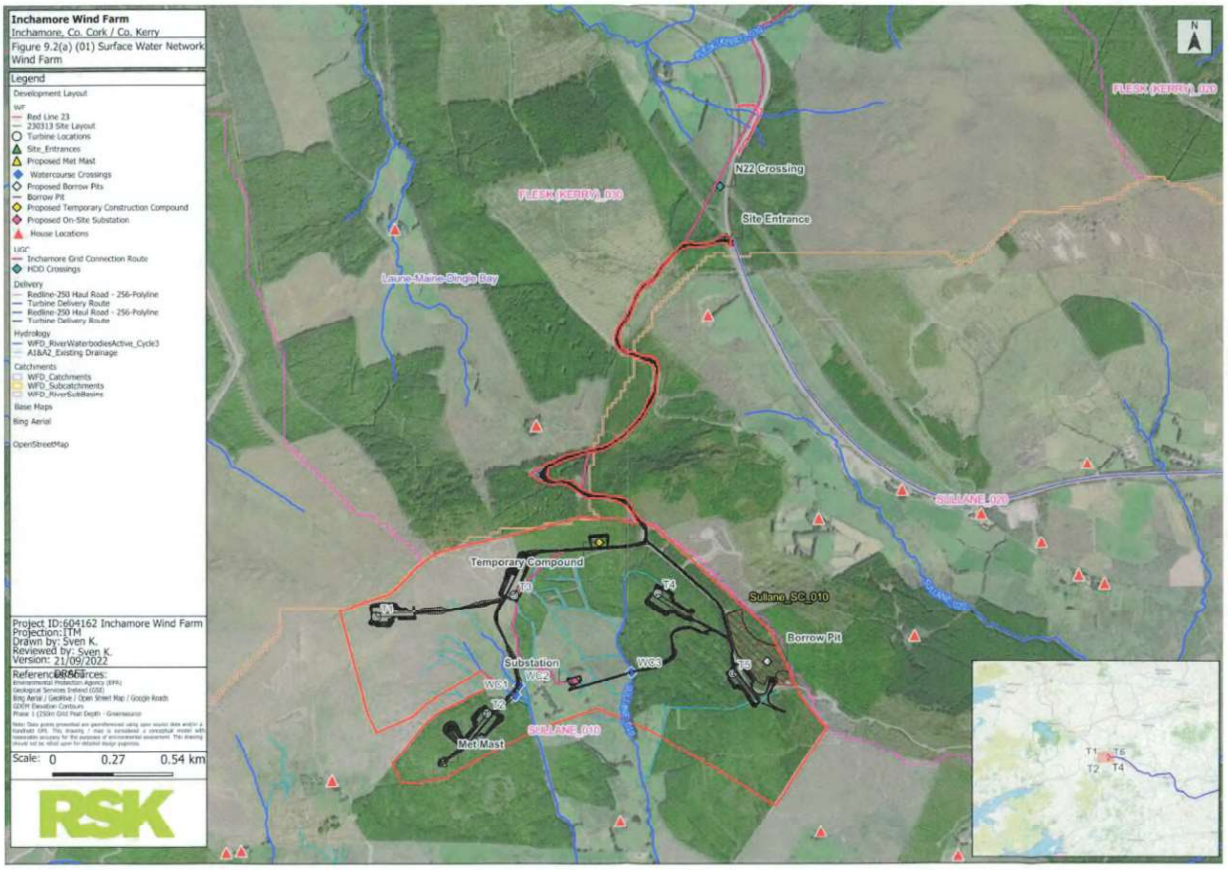

Figure 2.2: Surface Water Networks

The mapped (GSI, Bedrock 100k[1]) geological formation underlying the site is classified as the Gun Point Formation (DUGNPT) – which is comprised of Green-grey sandstone & Purple siltstone.

3 ENVIRONMENTAL CONSTRAINTS AND MITIGATION MEASURES

This is a live document and where there is a requirement for variation to the proposed management of surface water during construction the SWMP will be updated to reflect any such changes. The SWMP will be updated by the Environmental Manager (EM) and, where it is relevant to ecology, with input from the Ecological Clerk of Works (ECoW) before any changes are made to the proposed management of surface water during construction of Inchamore Wind Farm.

4 DRAINAGE SYSTEM OVERVIEW

The drainage system has been designed for this Development. It aims to ensure the Development does not change the baseline water quality within or downstream of the Site. The drainage system includes the following:

- A 65 m buffer from watercourses except at water crossings. These will be marked out prior to works beginning on site.
- Drainage will be installed in parallel with road construction.
- Check dams will be mainly used for road drainage. All road sections will drain to settlement-attenuation ponds.
- Silt fencing will be utilised during water crossings and around stockpiles
- Settlement-attenuation ponds will be used at every major excavation

4.1 SuDS Drainage Design

There is increased potential for water pollution, in particular sedimentation to local surface water features due to the excavation and generation of spoil and emplacement of stone materials during the construction stage of the project.

The design criteria for the SuDS design are as follows:

- To select and install ecologically sensitive drainage.
- To minimise alterations to the ambient site hydrology and hydrogeology.
- To provide settlement and treatment controls as close to the site footprint as possible and to replicate the existing hydrological environment of the site.
- To minimise sediment loads resulting from the development run-off during the

[1] Geological Survey of Ireland (GSI) Spatial Resources. Online: https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228. Accessed: May 2021

construction phase.

- To preserve greenfield runoff rates and volumes.
- To provide settlement ponds to encourage sedimentation and storm water runoff settlement.
- To reduce stormwater runoff velocities throughout the site to prevent scouring and encourage settlement of sediment locally.
- To manage the problems of erosion and allow for the effective revegetation of bare surfaces.
- To control water within the site and allow for the discharge of runoff from the site within the limits prescribed in the Salmonid Regulations.

The purpose of incorporating a SuDS design is:

- To provide sufficient detail to ensure that water pollution will not occur as a result of construction activities at the site and to minimise the risk of any such occurrence.
- To regulate the rate of surface water run-off downslope to prevent scouring and to encourage settlement of sediment locally.
- To minimise the quantity of sediment laden stormwater and resulting settlement pond sizes by separating "clean" water from the "dirty" development runoff. This can be seen in **Drawing No. 6226-PL-100 to 6226-PL-108**.
- To provide appropriate retention times such that no flooding will occur.
- To provide settlement ponds to encourage sedimentation and storm water runoff settlement.

4.2 Design Philosophy

The SuDS design must be managed and monitored (see Section 6) and particularly after Met Éireann Status Yellow, Orange or Red weather warnings for wind, rain or snow and during construction phase environmental auditing. The design rationale is that of an integrated approach where each element is assessed for its potential contribution to sediment suspension and the appropriate mitigation measures integrated into the layout design. The design principles are as follows:

Minimise → Intercept → Treat → Disperse → Dilute

4.2.1 Minimise

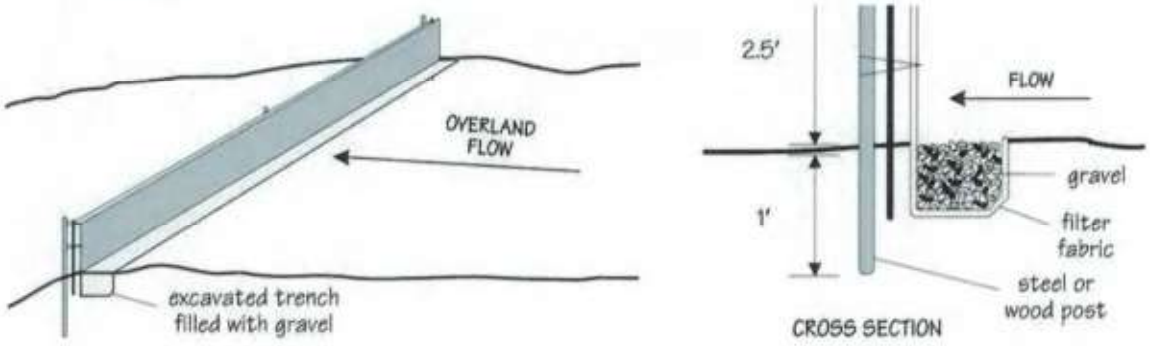

Figure 4.1: Diagram of silt fence[2]

The main principle of this SuDS design is to minimise the volume of 'dirty' water requiring treatment through means of informed, integrated and sustainable drainage design. It achieves this by keeping 'clean' water clean by interception and separation, and by collecting the 'dirty' water and treating it by removing the suspended sediments. The resultant outflow is dispersed across vegetation and will become diluted through contact with the clean water runoff in the buffer areas before entering site/ roadside drains.

[2] Norman, David & Wampler, Peter & Throop, Allen & Schnitzer, E. & Roloff, Jaretta. (1997). Best management practices for reclaiming surface mines in Washington and Oregon.

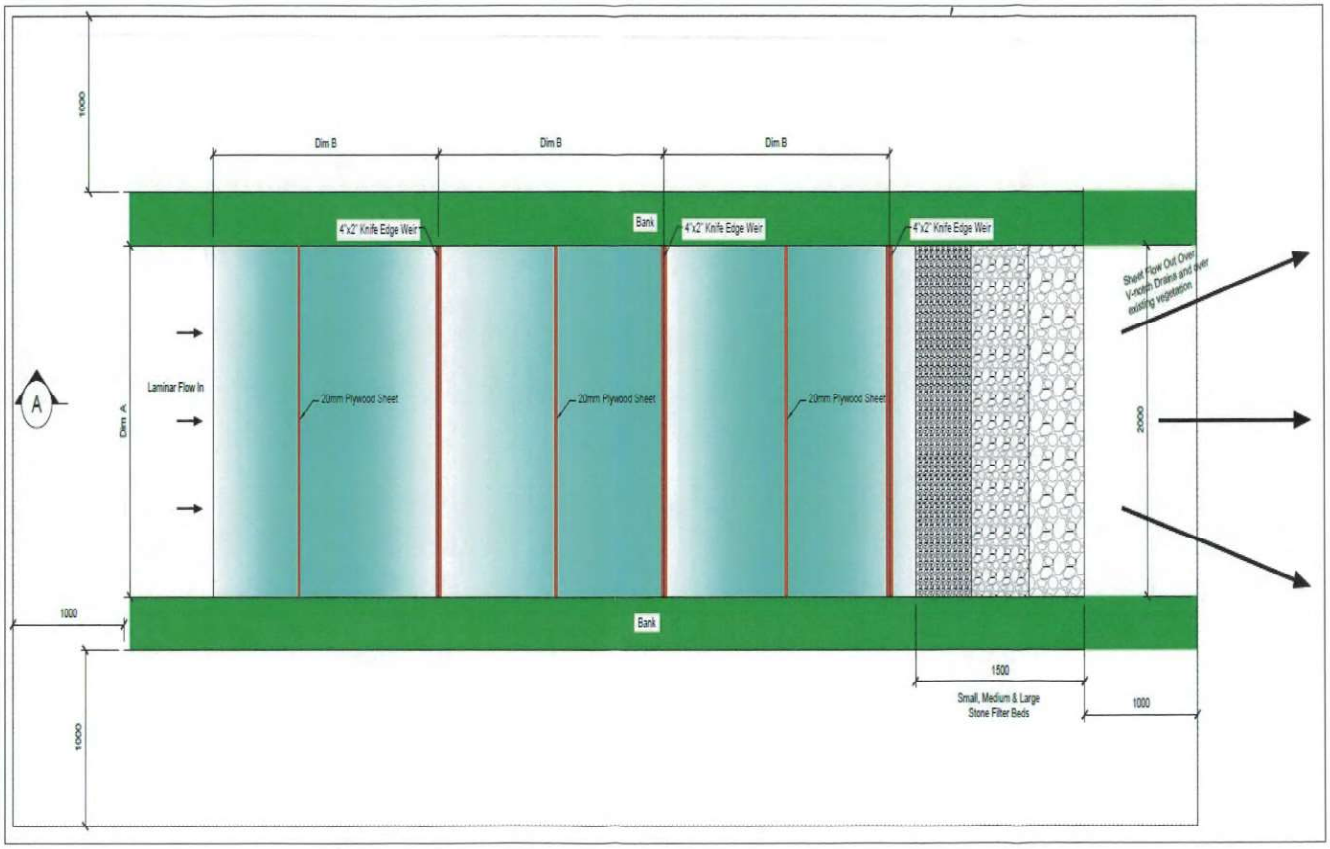

Figure 4.2: Diagram of settlement ponds outlet where outflow is dispersed across vegetated area

4.2.2 *Intercept*

The key sediment control measure is the separation of construction runoff from the clean water runoff that arises in the undisturbed areas of the site and surrounding lands. This significantly reduces the volume and velocity of dirty water that the sediment and erosion control measures need to deal with. To achieve separation, clean water infiltration collector drains or silt fences are positioned on the upslope and dirty water v-drains positioned along the verge, with site surfaces sloped towards dirty water v-drains. The remainder of this clean water will be regularly piped under the site roads and dirty water v-drains to avoid contamination. Piping the clean water regularly under the site roads allows the clean water to follow the course it would have taken before construction thus mimicking the existing surface water sheet flow pattern of the site.

Diagrammatic cross section of Interception Infiltration Drain is as shown in **Figure 4.3**.

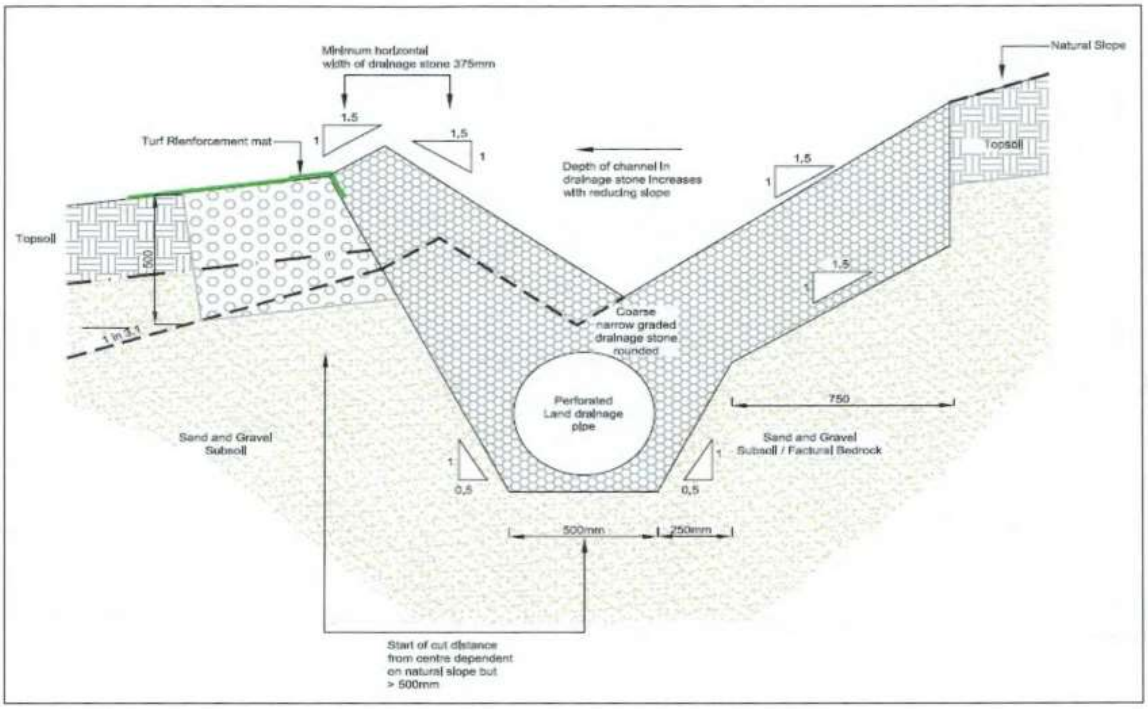

Figure 4.3: Diagrammatic cross section of Interception Infiltration Drains

4.2.3 *Treat, Disperse and Dilute*

The clean water infiltration interceptor drains are positioned upslope of the development footprint, to prevent any mixing of the clean and 'dirty' water. The infiltration interceptor drains redirect the clean water away from the site infrastructure, as best suits the natural topography of each sector. The clean water outflow is then discharged into either, an existing drainage network or dispersed through an area of vegetation where it can percolate into the ground naturally.

In the drawings, 'dirty water' drains, indicated in orange, collect all incident rainwater that falls on the development infrastructure. These then drain into Settlement-Attenuation ponds. The treated effluent from the Settlement-Attenuation ponds is then dispersed across vegetation (through buffered outfalls) to further filter the discharge. Dispersal in this manner has the effect of allowing the smaller particle sizes to be taken up by the vegetation. Please see **Drawing No. 6226-PL-301 to 304** and **6226-PL-100 to 108**.

5 DETAILED DESIGN CONSIDERATIONS

5.1 Overview

The following elements in series are proposed:

- Open Constructed Drains for development run-off collection and treatment;
- Collection Drains for upslope "clean" water collection and dispersion;
- Filtration Check Dams to reduce velocities along sections of road which run perpendicular to contours;
- Settlement-Attenuation Ponds and Buffered Outfalls to control and store development runoff to achieve settlement and attenuation prior to discharge at Greenfield runoff rates.

These measures provide a surface water management train that will mitigate any adverse impact on the hydrology of the site and surrounds during the construction phase of the project.

5.2 SuDS Design Principles

The approach to treatment and attenuation of storm water is as follows:

- The dimensions of drainage features will avoid intercepting large volumes of water because this could lead to an overloading of the system and a failure to treat and attenuate storm water. Any changes to the Surface Water Management Plan must be agreed with the Project Hydrologist and the Ecological Clerk of Works.
- Surface water runoff from the proposed Site Access Tracks will be managed with crossfall downslope to mimic the natural drainage patterns of the Site.
- Trackside drains (dirty water) are open gently sloping drainage channels to convey dirty water, trap sediment, enhance filtration and slow down the rate and magnitude of runoff that could enter the local watercourses. The drains will be a maximum of 350 mm – 500 mm in depth and the turf will be taken as a single piece and placed on the downslope side of the drain. Therefore, once construction works are complete the turves can be put back in place with minimal ecological damage.
- Drainage vegetation (vegetation including grasses established within a drainage channel can filter runoff water. Living and decomposing plants and roots and associated microorganisms trap sediments and take up excess nutrients) used will be similar in species to the local area and will be approved by the Ecological Clerk of Works.
- Temporary erosion protection together with silt fences may be required until the vegetation becomes established (coir matting or similar) as shown in **Plate 5.1**.
- Roads will be constructed from aggregate and will not be surfaced with bitumen materials, thus allowing for permeation and helping to reduce runoff volumes. Therefore,

a reduced runoff coefficient of 65% is applicable. For hardstands, an open textured stone will be used as these will only be functional during construction of the specific turbine, a higher permeability is envisaged and the run-off co-efficient is reduced to 50%.

- An additional 20% rainfall will be included to allow for a possible increase in rainfall intensity due to climate change.
- Stormwater runoff within the trackside drainage will be treated through the provision of check dams, within a range depending on local slope of the drain as significant levels of sediment are not expected because of the surface dressing of the roads. All trackside drainage will drain to settlement-attenuation ponds.

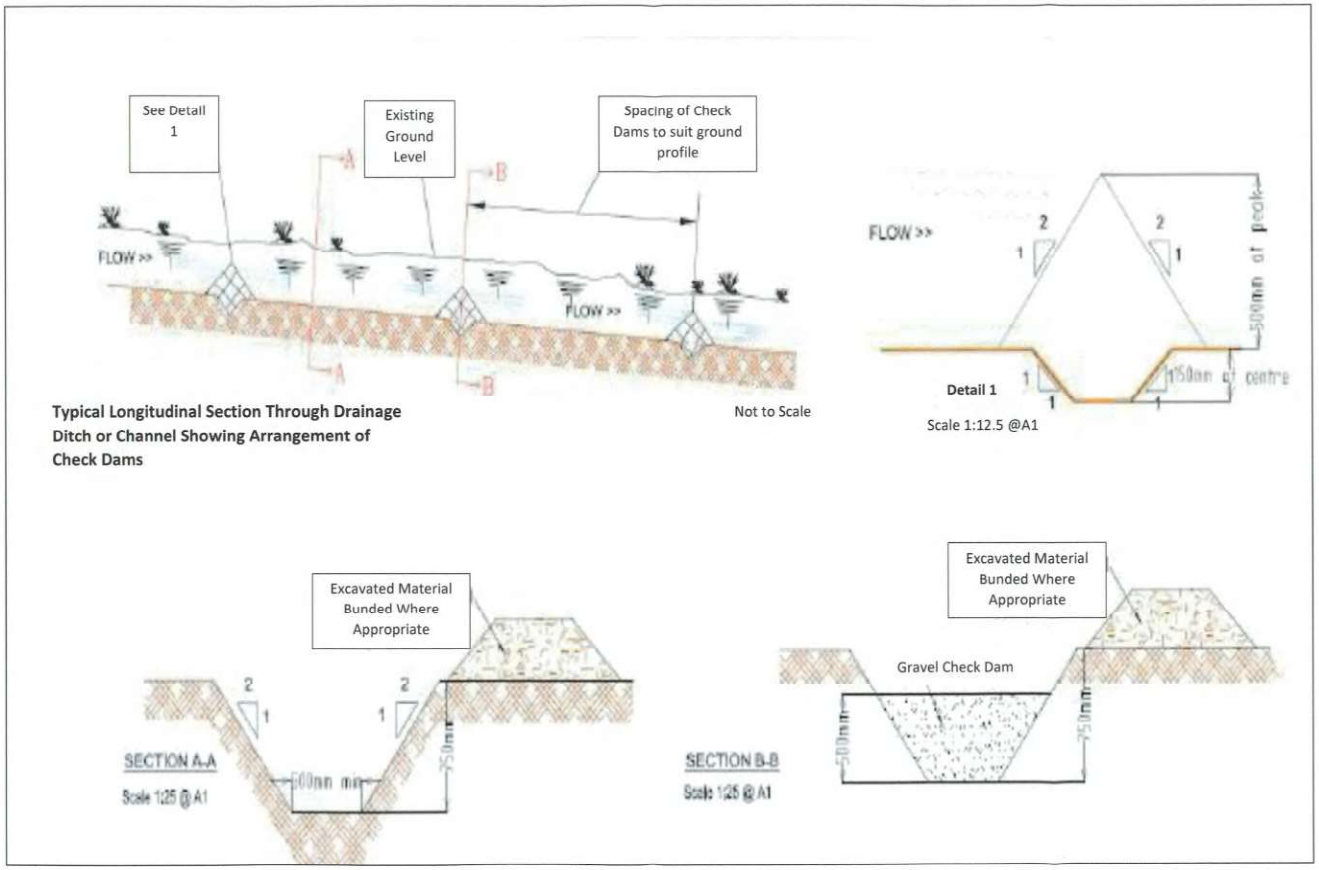

Figure 5.1: Typical check dam arrangement

- The stone used for the construction of the check dams will be washed graded stone with a size range between approximately 5 mm and 40 mm, see **Figure 5.5 and Plate 5.3**.
- Discharging directly back into the surrounding area will assist in maintaining the hydrological characteristics of the Site. It will prevent wetlands from drying out and without significantly impacting on ecosystems.
- Where vegetation is removed from sloped areas during construction, these areas will be reinstated as early as possible using the same vegetation or similar vegetation as advised by the ECoW.
- Under track drainage will be provided with drainage pipes at existing surface water features. The under-track drainage will provide a means for flows to pass and maintain the natural flow throughout the site, see **Figure 5.2.**
- A sump may be required for trench dewatering. Water will subsequently be pumped into settlement-attenuation ponds or a siltbuster.
- The level of silt runoff during construction will be monitored which is detailed in (**Management Plan 2 Water Quality Management Plan** and **Chapter 9: Hydrology and Hydrogeology**) and if found to be excessive of 25 mg/L in any area, will subsequently be managed by the provision of additional silt attenuation features such as silt fences or silt traps.

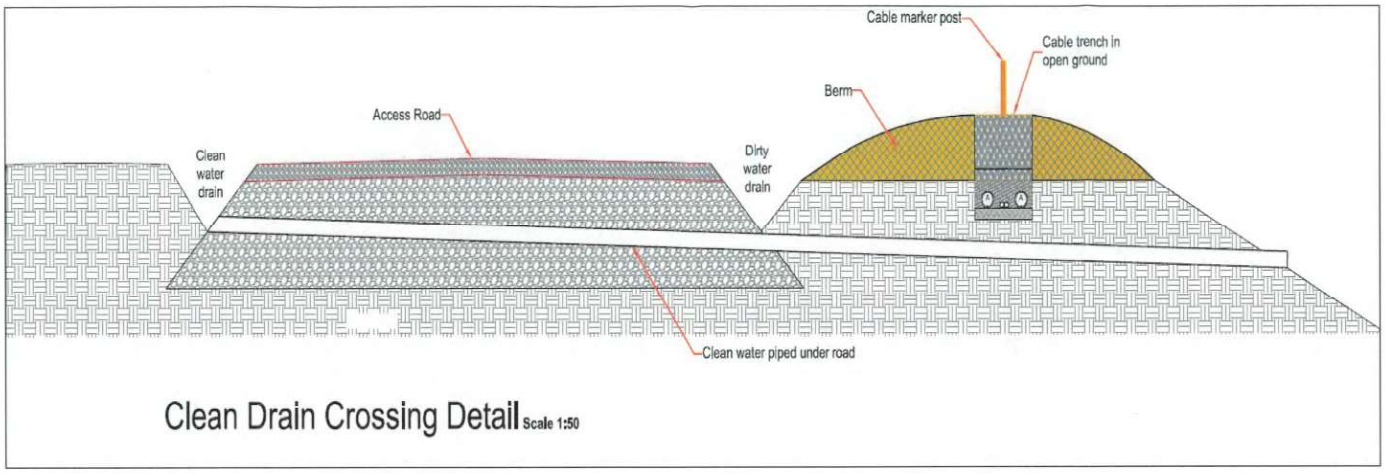

Figure 5.2: Proposed Road and Trench Sections and Drain Crossing Details.

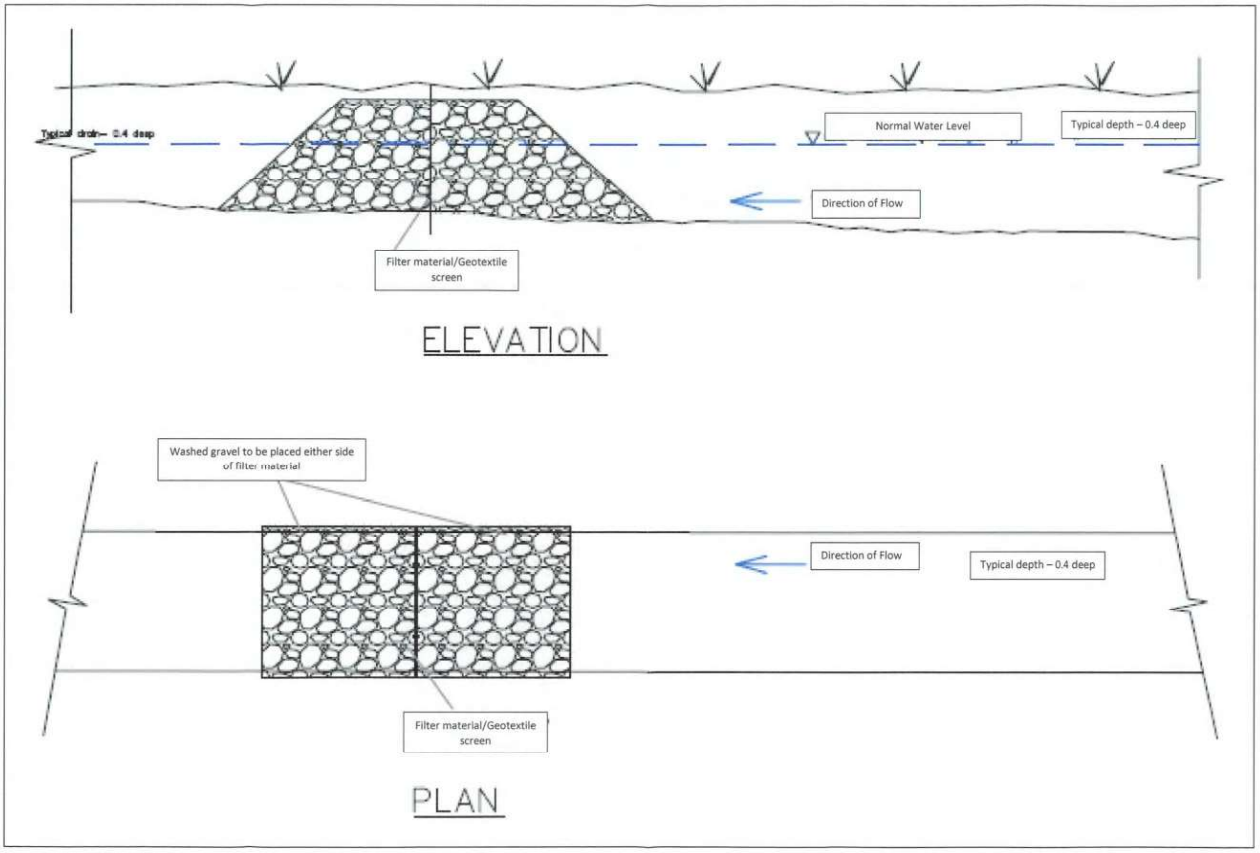

Figure 5.3 Typical silt trap

- Daily visual inspections will be carried out on the drainage network including all settlement-attenuations ponds and their discharge.
    - Turbidity can be measured in the field and will indicate if the the suspended solids discharge limit of <25 mg/L is being achieved. Where the discharge exceeds this limit, the discharge will be diverted to a siltbuster prior to discharge to ensure the suspended solids concentration is <25 mg/L.
- Field drains will be piped directly under the track through appropriately sized drainage pipes.
- Appropriate site management measures (see CEMP, Section 3.4) will be taken to ensure that runoff from the construction site is not contaminated by fuel or lubricant spillages.
- There will be no discharge of sewage effluent or contaminated drainage into any surface water feature.

Plate 5.1: Photograph of Coir Matting

- The Turbine Delivery Route (TDR) does not require any proposed drainage plan as it will utilise existing national and local roads which have already been designed to include drainage.
- The Grid Connection Route (GCR) will require some temporary stockpiling. These temporary stockpiles will be located a minimum of 25 m from surface water features and all stockpiling locations will be subject to approval by the Site Manager and Project Ecological Clerk of Works (ECoW).
    - Excavated trenches will be dewatered if required, from a sump installed within the low section of the opened trench. Where dewatering is required, dirty water will be fully and attenuated, through silt bags, before being discharged to surface water drainage feature. Where required, grass will be reinstated by

seeding or through the replacement of grass turves to prevent loose soil/sediment material from entering surface water features.

5.3 Cut-off Ditches / Collector Drains (Clean Water)

These drains will be a maximum of 350 mm – 500 mm in depth and are outlined in **Figure 5.1**.

5.4 Trackside Drains (Dirty Water)

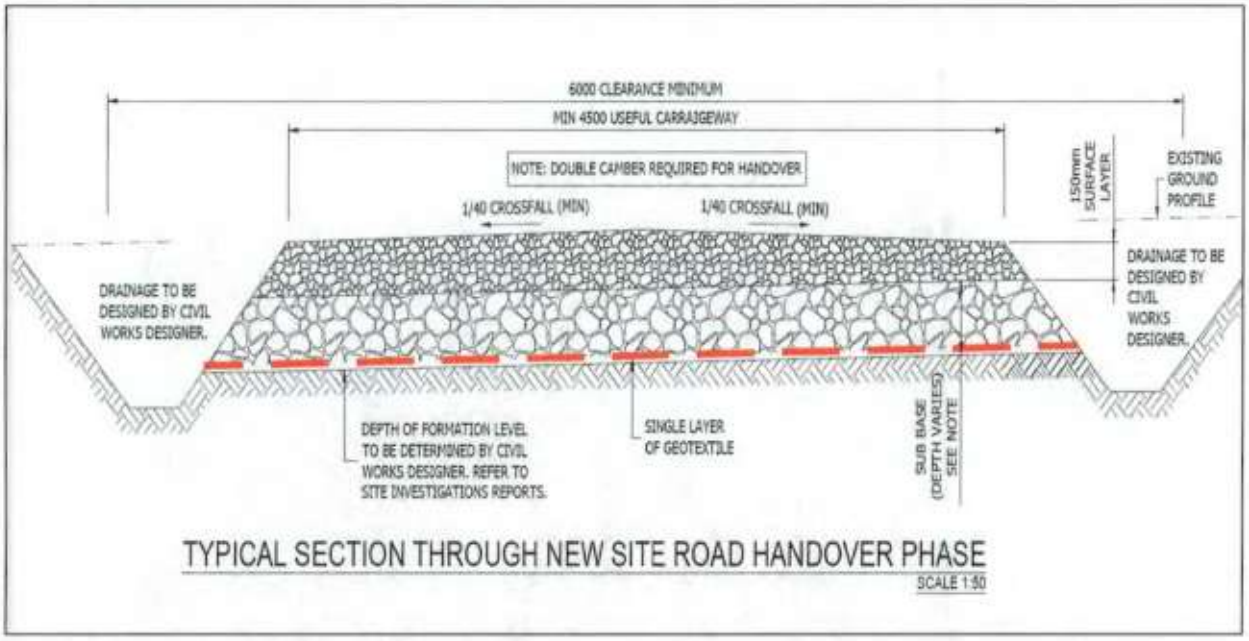

Figure 5.4: New Site Road Drainage

5.5 Silt Fences

Silt Fences are designed to effectively filter the water, holding back the silt and allowing the water through, they need to be installed correctly with the lower part of the fence dug into the ground. Silt fences are also required to be cleaned out on a regular basis, particularly after periods of heavy rainfall. Silt fences need to be inspected daily and maintained on a monthly basis in order to ensure that silty water is not running under or round the silt fences. Silt fences can also be used to divert clean water away from the development area, minimising the volume of dirty water.

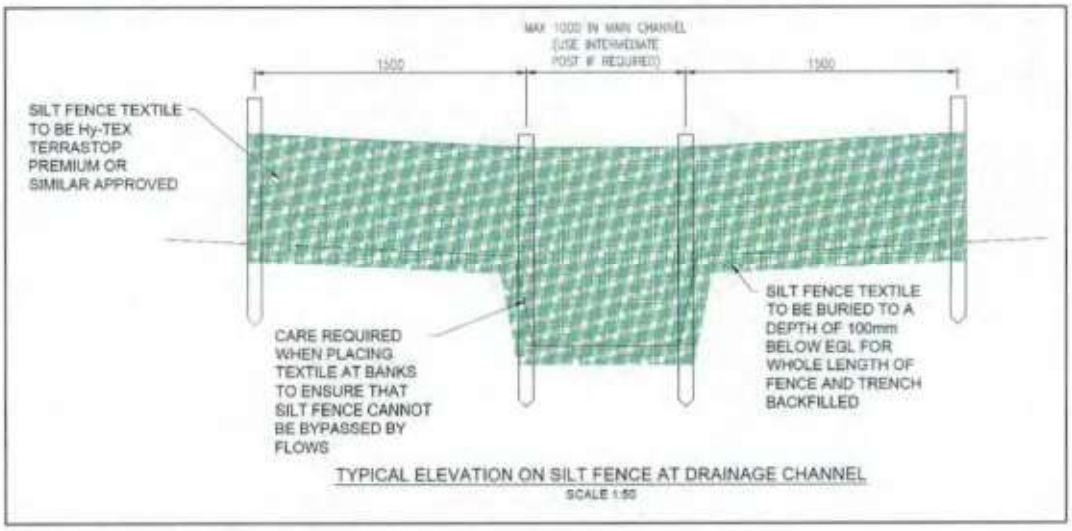

Figure 5.5: Illustration of silt fencing

Plate 5.2: Photograph of silt fencing

5.6 Filtration Check Dams

Check dams as set out in **Figure 5.6** (flow barriers or dams constructed across the drainage channel) will be installed at regular intervals within the dirty trackside drains to reduce erosion and allow for greater flow control. These check dams are required to reduce the velocity of water and therefore allow settlement of coarser sediment particles as well as silt at low flow conditions. Reduction in flow velocity will also prevent scouring of the drainage channel itself.

Rock filter bunds may be used for check dams however, stone can also be used if properly anchored.

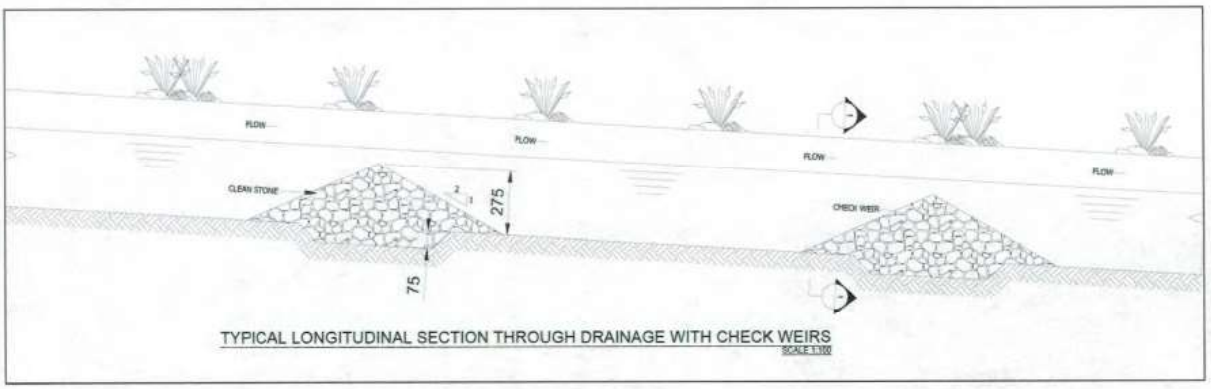

Figure 5.6: Diagram showing the function of check dams

Plate 5.3: Photograph of Check Dams

Settlement build up will be monitored daily and cleaned during the construction stage when necessary. The number and location of check dams will be dependent on the slope, flow and volume of water, although the following general rules will be applied:

- The maximum spacing between check dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam;
- The centre of the check dam will be at least 0.2 m lower than the outside edges;
- Side slopes will be 1:2 or less;
- A Terram membrane barrier or similar non-woven geotextile membrane is to be placed around the check dam

Check dams will be keyed at least 0.1 m into the drainage channel bottom in order to prevent the dam washing out; and

- Check dams will be maintained and monitored on a regular basis. Sediment will be removed before it reaches one half the original dam height.

Worked example for check dam spacings:

The depth of a check dam is 0.3 m high: 0.3 m x (1 in 100 gradient) = 30 m spacing.

For a 0.3 m high Check Dam: 0.3 m x (1 in 50 gradient) = 15 m spacing.

See **Table 5.1** for recommended spacings, relative to the gradient of drain, for a 0.3 m high check dam.

Table 5.1: Check Dam Spacing

Max Spacing (m)	Gradient
3	10% (1 in 10)
4	8% (1 in 12)
5	6% (1 in 17)
6	5% (1 in 20)
8	4% (1 in 25)
10	3% (1 In 33)
15	2% (1 In 50)
20	1.5% (1 in 67)
30	(1 in 100)

5.7 Settlement-Attenuation Ponds

Runoff from the windfarm road surface will be attenuated to mimic natural runoff patterns. To capture runoff generated within the development footprint it is proposed to use constructed trackside drains. Accumulations of runoff will then be transferred to Settlement-Attenuation ponds. See detail drawings (**Drawing No. 6226-PL-301 to 304**) which display a diagrammatic cross section through a settlement pond within the drainage regime. Settlement-Attenuation ponds are to be securely fenced to prevent easy access. Three consecutive ponds are to be situated together for further settlement of particles.

Plan view of settlement ponds as shown in **Figure 4.2**.

Plate 5.4a: Completed settlement pond system

Plate 5.4b: Completed settlement pond system showing levels of settlement

The ponds are utilised to attenuate and to aid the removal of suspended solids from site runoff water. All the pond locations are displayed within the site drainage drawings attached as **Appendix D**. Settlement ponds will be placed at 28 No. locations along the drainage footprint. The buffered outfalls from the settlement-attenuation ponds will be located in vegetated areas greater than 65 m from any waterbody. The settlement-attenuation ponds are deigned to settle and attenuate to ensure the suspended solids concentration of the water discharged from the ponds in <25 mg/L and will not impact any sensitive receptors (e.g., freshwater pearl mussel catchments or salmonid rivers) downstream of the construction works.

Where there is an exceedance of 25 mg/L suspended solids, the discharge will be diverted to a siltbuster.

The settlement-attenuation ponds will buffer volumes of runoff discharging from the drainage system during periods of high rainfall (1 in 200-year rainfall event), by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses.

Any changes to the Surface Water Management Plan will be agreed with the ECoW before drainage works commence.

Calculation parameters for the determination of storage requirements have been undertaken and are as follows:

- A 1 in 200-year rainfall return design (Source: Met Éireann - Please refer to **Appendix B**).
- An initial outlet overflow rate (the amount of water leaving the sediment pond per second per hectare) is applied of 36.92/s/ha (litres per second) which approximates to Greenfield run-off rates for the site. (Source: HR Wallingford – Please refer to **Appendix C**).
- The Rational Method is subsequently applied to calculate the flow volumes into each settlement pond over these respective periods. The Rational Method is expressed by the formula $V = 2.78CAIt$, where V is the volume of water generated in the settlement pond, C is the run-off co-efficient, A is the area of the hardstanding / catchment, I is rainfall depth and t is the duration of rainfall occurrence.
- A runoff coefficient of 0.60 (20% for Climate Change, 50% for runoff) is applied to all hardstand areas. These areas are only used using during the construction of turbine bases and delivery of turbine components. Therefore, their porosity will not be impacted during the construction or operation of the proposed development.

- A runoff coefficient of 0.78 (20% for Climate Change, 65% for runoff) is conservatively applied to the footprint areas excluding hardstands. As these areas will be used more frequently, they are more likely to become clogged with dirt and their porosity to reduce.

Table 6.2 identifies settlement-attenuation ponds designed to treat and attenuate each development catchment area. The details in **Table 6.2** are based on the calculations included in **Appendix D**.

Table 6.2: Settlement-Attenuation Pond Sizing

Pond Ref.	Development Area (m^2)	Residual Volume (m^3)	Pond Dimensions			Overall Volume of Attenuation Pond (m^3)
			Dim. Length (m)	Dim. Width (m)	Dim. Height (m)	
SP1	7,350	120	21	6	1	126
SP2	6,000	78	15	6	1	90
SP3	3,350	54	15	4	1	60
SP4	8,000	130	18	8	1	144
SP5	11,930	184	24	8	1	192
SP6	4,840	68	18	4	1	72
SP7	10,000	140	18	8	1	144
SP8	6,950	113	21	6	1	126
SP9	7,650	114	21	6	1	126
SP10	9,800	149	21	8	1	168
SP11	3,400	55	15	4	1	60
SP12	425	7	6	2	1	12
SP13	465	8	6	2	1	12
SP14	3,545	58	15	4	1	60
SP15	11,225	163	21	8	1	168
SP16	4,150	67	12	6	1	72
SP17	4,735	77	15	6	1	90
SP18	6,000	98	18	6	1	108
SP19	375	6	3	2	1	6
SP20	375	6	3	2	1	6
SP21	1,400	23	9	3	1	27
SP22	192	3	3	2	1	6
SP23	192	3	3	2	1	6
SP24	672	11	6	2	1	12
SP25	7,830	108	15	8	1	120
SP26	6,630	108	15	8	1	120
SP27	7,360	120	15	8	1	120

Pond Ref.	Development Area (m^2)	Residual Volume (m^3)	Pond Dimensions			Overall Volume of Attenuation Pond (m^3)
			Dim. Length (m)	Dim. Width (m)	Dim. Height (m)	
SP28	1,400	23	9	3	1	27

5.8 Cable Trench Drainage

Cable trenches are typically constructed in short sections c. 100 m this minimises for drainage runoff to pick up large volumes of silt or suspended solids. Drainage runoff from cable trench works areas, is managed by storing excavated material on the upgradient side of the trench. Where rainfall causes runoff from the excavated material, the material is captured in the downgradient cable trench. Excess subsoil is removed from the cable trench works area immediately upon excavation. The excavated trench will be dewatered if required, from a sump installed within the low section of the opened trench. Where dewatering is required, silt laden water will be fully and appropriately attenuated, through silt bags, before being appropriately discharged to vegetation or surface water drainage feature.

On steeper slopes, silt fences will be installed temporarily downgradient of the cable trench works area, or on the downhill slope below where excavated material is being temporarily stored to control run-off.

5.9 Forestry Felling Drainage Management

Best practise methods related to water incorporated into the forestry management and water quality protection measures are as follows:

- Forest Service (2000): Forestry and Water Quality Guidelines. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford
- Forest Service, (2000): Code of Best Forest Practice – Ireland. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford
- COFORD (2004): Forest Road Manual – Guidelines for the design, construction and management of forest roads

Control Measures

- Forestry felling works must be overseen by the ECoW. Prior to the forestry works commencing the ECoW will carry out a pre-felling inspection to identify the main drainage ditches.

- Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff.
- Machinery will be chosen which will minimise soils disturbance. Consideration will be given to the use of cable-crane extraction, to reduce soil disturbance;
- Checking and maintenance of roads and culverts will be undertaken by the ECoW through the felling operation;
- No tracking of vehicles through watercourses will occur, as vehicles will use road infrastructure and watercourse crossing points;
- Drains which flow from the areas to be felled will be blocked, and temporary sediment settlement ponds and silt fences will be used;
- Brash mats will be used to support vehicles on soft ground, reducing peat and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding will occur;
- Timber will be stacked in dry areas away from surface water buffer zones. Straw bales to be emplaced on the down-gradient side of timber processing areas;
- Surface water samples will be taken downstream during the felling works at locations (**EIAR Figure 9.5a**). Daily sampling is recommended given the short duration and temporary nature of the works.

5.10 High Rainfall Events

- An emergency response system has been developed for the construction phase of the project (see **Management Plan 1: Emergency Response Plan)**.
- There will be a 24-hour advance meteorological forecasting (Met Éireann download) linked to a trigger-response system. When a pre-determined rainfall trigger levels is exceeded (e.g., sustained rainfall (any foreseen rainfall event longer than 4-hour duration) and/or any yellow or greater rainfall warning (>25mm/hour) issued by Met Éireann), planned responses will be undertaken.
- These responses will include, *inter alia*; cessation of construction until the storm event including storm runoff has passed over. All construction works will cease during storm events such as yellow warning rainfall events. Following heavy rainfall events, and before construction works recommence, the Site will be inspected and corrective measures implemented to ensure safe working conditions e.g., dewatering of standing water in open excavations, etc.
- Exposed soils/peat (exposed temporary stockpiles) will be covered with plastic sheeting during all relatively heavy rainfall events and during periods where works have

temporarily ceased before completion at a particular area (e.g., overnight and weekends).

- Mitigation measures related to surface water quality as outlined in the CEMP will be implemented before excavation works commence.

6 MAINTENANCE AND MONITORING

- Surface water runoff control infrastructure will be checked daily and maintained on a monthly basis or as required.
- Settlement-Attenuation ponds and check dams will be checked daily and maintained (desludged/settle solids removed) on a monthly basis or as required, particularly during the construction phase of the Development. The agitation of solids will be kept to a minimum during these works.
- The discharge from ponds located upstream of a freshwater pearl catchment and their discharge will be continuously monitored for turbidity. Turbidity can be measured in the field and will indicate if the suspended solids discharge limit of <25 mg/L is being achieved. Where the discharge exceeds this limit, the discharge will be diverted to a silt buster prior to discharge to ensure the suspended solids concentration is <25 mg/L.
- During the construction phase, daily visual inspections will be carried out on all ponds and their discharge. Monthly grab samples will be taken from all ponds and sent to a laboratory to analyse the suspended solids content.

The monitoring requirements for local surface water bodies upstream and downstream of the Site during the construction phase are outlined in **EIAR Appendix 2.1 Construction Environmental Management Plan, Management Plan 2- Water Quality Management Plan**.

7 POST CONSTRUCTION DRAINAGE MANAGEMENT

Following the completion of construction, all settlement-attenuation ponds will remain on site.

APPENDIX A

MET ÉIREANN RAINFALL DATA

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 113397, Northing: 78926,

	Interval		Years												
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	3.1,	4.0,	4.5,	5.2,	5.6,	5.9,	6.9,	8.0,	8.7,	9.7,	10.5,	11.1,	12.0,	12.7,	13.3,	N/A ,
10 mins	4.4,	5.6,	6.3,	7.2,	7.8,	8.2,	9.7,	11.2,	12.1,	13.5,	14.6,	15.5,	16.7,	17.7,	18.5,	N/A ,
15 mins	5.2,	6.6,	7.4,	8.5,	9.2,	9.7,	11.4,	13.1,	14.3,	15.8,	17.2,	18.2,	19.7,	20.8,	21.8,	N/A ,
30 mins	7.2,	9.2,	10.2,	11.7,	12.6,	13.3,	15.5,	17.8,	19.3,	21.3,	23.1,	24.4,	26.3,	27.8,	29.0,	N/A ,
1 hours	10.2,	12.9,	14.2,	16.1,	17.3,	18.2,	21.1,	24.2,	26.1,	28.7,	31.0,	32.7,	35.2,	37.1,	38.6,	N/A ,
2 hours	14.3,	17.9,	19.7,	22.2,	23.8,	25.1,	28.8,	32.9,	35.4,	38.7,	41.6,	43.8,	47.0,	49.4,	51.4,	N/A ,
3 hours	17.5,	21.7,	23.8,	26.8,	28.7,	30.2,	34.6,	39.3,	42.2,	46.1,	49.5,	52.0,	55.7,	58.5,	60.7,	N/A ,
4 hours	20.1,	25.0,	27.3,	30.7,	32.8,	34.4,	39.4,	44.6,	47.8,	52.2,	55.9,	58.7,	62.8,	65.9,	68.4,	N/A ,
6 hours	24.6,	30.3,	33.1,	37.0,	39.5,	41.4,	47.2,	53.3,	57.1,	62.2,	66.5,	69.7,	74.4,	78.0,	80.9,	N/A ,
9 hours	30.0,	36.8,	40.1,	44.7,	47.7,	49.9,	56.7,	63.8,	68.2,	74.0,	79.0,	82.7,	88.2,	92.3,	95.7,	N/A ,
12 hours	34.6,	42.2,	45.9,	51.1,	54.4,	56.9,	64.5,	72.4,	77.3,	83.8,	89.3,	93.4,	99.5,	104.1,	107.7,	N/A ,
18 hours	42.2,	51.3,	55.6,	61.7,	65.6,	68.5,	77.4,	86.6,	92.2,	99.8,	106.2,	110.9,	118.0,	123.2,	127.4,	N/A ,
24 hours	48.7,	58.8,	63.7,	70.6,	74.9,	78.2,	88.1,	98.3,	104.6,	113.0,	120.1,	125.3,	133.1,	138.9,	143.5,	159.0,
2 days	64.2,	76.4,	82.2,	90.2,	95.2,	99.0,	110.3,	122.0,	129.1,	138.5,	146.4,	152.2,	160.8,	167.1,	172.2,	189.1,
3 days	77.6,	91.3,	97.8,	106.8,	112.4,	116.6,	129.2,	142.0,	149.9,	160.1,	168.7,	175.1,	184.4,	191.2,	196.7,	214.8,
4 days	89.7,	104.9,	112.1,	121.9,	128.0,	132.6,	146.3,	160.1,	168.6,	179.6,	188.8,	195.6,	205.6,	212.9,	218.8,	238.0,
6 days	112.0,	129.7,	138.0,	149.3,	156.3,	161.5,	177.1,	192.8,	202.3,	214.7,	225.0,	232.6,	243.7,	251.8,	258.3,	279.5,
8 days	132.7,	152.5,	161.8,	174.4,	182.2,	188.0,	205.2,	222.5,	233.0,	246.6,	257.8,	266.1,	278.1,	287.0,	294.0,	317.0,
10 days	152.3,	174.1,	184.3,	198.1,	206.6,	212.9,	231.7,	250.4,	261.7,	276.4,	288.5,	297.4,	310.3,	319.8,	327.3,	351.9,
12 days	171.2,	194.9,	205.9,	220.8,	230.0,	236.7,	256.9,	276.9,	289.0,	304.7,	317.6,	327.0,	340.8,	350.9,	358.9,	384.9,
16 days	207.6,	234.7,	247.2,	264.1,	274.5,	282.1,	304.8,	327.3,	340.7,	358.2,	372.6,	383.0,	398.3,	409.4,	418.2,	446.9,
20 days	242.6,	272.8,	286.7,	305.4,	316.9,	325.4,	350.3,	375.0,	389.8,	408.8,	424.5,	435.9,	452.5,	464.6,	474.1,	505.2,
25 days	285.3,	319.1,	334.6,	355.4,	368.1,	377.5,	405.1,	432.3,	448.5,	469.4,	486.5,	499.0,	517.1,	530.3,	540.7,	574.4,

NOTES:
N/A Data not available
These values are derived from a Depth Duration Frequency (DDF) Model
For details refer to:
'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',
Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

APPENDIX B

HR WALLINGFORD GREENFIELD RUN-OFF RATES

Print | Close Report

HR Wallingford
Working with water

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Ken Dunne
Site name:	Inchamore WF
Site location:	Kerry / Cork

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.94857° N
Longitude:	9.29563° W
Reference:	1874299347
Date:	Mar 29 2023 17:08

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 170.1

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics	Default	Edited
SOIL type:	5	5
HOST class:	N/A	N/A
SPR/SPRHOST:	0.53	0.53

Hydrological characteristics	Default	Edited
SAAR (mm):	1729	1729
Hydrological region:	13	13
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	1.65	1.65
Growth curve factor 100 years:	1.95	1.95
Growth curve factor 200 years:	2.15	2.15

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
Q_{BAR} (l/s):	2683.18	2683.18
1 in 1 year (l/s):	2280.7	2280.7
1 in 30 years (l/s):	4427.24	4427.24
1 in 100 year (l/s):	5232.2	5232.2
1 in 200 years (l/s):	5768.83	5768.83

APPENDIX C

SETTLEMENT POND SIZING CALCULATIONS

Management Plan 3; Appendix C

Inchamore SuDS Drainage Design

Rational Method Q = 0.278 CiA

		Catchment Area										Velocit
Ref	Total Catchment A (m^2)	A Hardstand (m^2)	A excl Hardstand (m^2)	A Hardstand (km^2)	A excl Hardstand (km^2)	Residual Volume (m3)	Width (m)	Height (m)	Required Length (m)	Optimised Length	Ref	Flow Rate (m^3/sec)
SP1	7350	0	7350	0.0000	0.0074	119.7	6.00	1.0	19.9	21	SP1	0.058
SP2	6000	3200	2800	0.0032	0.0028	78.3	6.00	1.0	13.1	15	SP2	0.051
SP3	3350	0	3350	0.0000	0.0034	54.6	4.00	1.0	13.6	15	SP3	0.027
SP4	8000	0	8000	0.0000	0.0080	130.3	8.00	1.0	16.3	18	SP4	0.063
SP5	11930	1700	10230	0.0017	0.0102	184.0	8.00	1.0	23.0	24	SP5	0.096
SP6	4840	1700	3140	0.0017	0.0031	68.5	4.00	1.0	17.1	18	SP6	0.040
SP7	10000	3700	6300	0.0037	0.0063	140.4	8.00	1.0	17.6	18	SP7	0.083
SP8	6950	0	6950	0.0000	0.0070	113.2	6.00	1.0	18.9	21	SP8	0.055
SP9	7650	1700	5950	0.0017	0.0060	114.3	6.00	1.0	19.0	21	SP9	0.063
SP10	9800	1700	8100	0.0017	0.0081	149.3	8.00	1.0	18.7	21	SP10	0.080
SP11	3400	0	3400	0.0000	0.0034	55.4	4.00	1.0	13.8	15	SP11	0.027
SP12	425	0	425	0.0000	0.0004	6.9	2.00	1.0	3.5	6	SP12	0.003
SP13	465	0	465	0.0000	0.0005	7.6	2.00	1.0	3.8	6	SP13	0.004
SP14	3545	0	3545	0.0000	0.0035	57.7	4.00	1.0	14.4	15	SP14	0.028
SP15	11225	3200	8025	0.0032	0.0080	163.4	8.00	1.0	20.4	21	SP15	0.093
SP16	4150	0	4150	0.0000	0.0042	67.6	6.00	1.0	11.3	12	SP16	0.033
SP17	4735	0	4735	0.0000	0.0047	77.1	6.00	1.0	12.9	15	SP17	0.037
SP18	6000	0	6000	0.0000	0.0060	97.7	6.00	1.0	16.3	18	SP18	0.047
SP19	375	0	375	0.0000	0.0004	6.1	2.00	1.0	3.1	3	SP19	0.003
SP20	375	0	375	0.0000	0.0004	6.1	2.00	1.0	3.1	3	SP20	0.003
SP21	1400	0	1400	0.0000	0.0014	22.8	3.00	1.0	7.6	9	SP21	0.011

6226 Inchamore WF

		Catchment Area										Velocit
Ref	Total Catchment A (m^2)	A Hardstand (m^2)	A excl Hardstand (m^2)	A Hardstand (km^2)	A excl Hardstand (km^2)	Residual Volume (m3)	Width (m)	Height (m)	Required Length (m)	Optimised Length	Ref	Flow Rate (m^3/sec)
SP22	192	0	192	0.0000	0.0002	3.1	2.00	1.0	1.6	3	**SP22**	0.002
SP23	192	0	192	0.0000	0.0002	3.1	2.00	1.0	1.6	3	**SP23**	0.002
SP24	672	0	672	0.0000	0.0007	10.9	2.00	1.0	5.5	6	**SP24**	0.005
SP25	7830	3200	4630	0.0032	0.0046	108.1	8.00	1.0	13.5	15	**SP25**	0.066
SP26	6630	0	6630	0.0000	0.0066	108.0	8.00	1.0	13.5	15	**SP26**	0.052
SP27	7360	0	7360	0.0000	0.0074	119.8	8.00	1.0	15.0	15	**SP27**	0.058
SP28	1400	0	1400	0.0000	0.0014	22.8	3.00	1.0	7.6	9	**SP28**	0.011

6226 Inch re WF

Catchment			SP1	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00735	0.237	71.1	10.2	7.5	63.7
M200 10min	10	17.3	0.278	0.78	103.8	0.00735	0.165	99.3	20.3	15.0	84.3
M200 15min	15	20.3	0.278	0.78	81.2	0.00735	0.129	116.5	30.5	22.4	94.0
M200 30min	30	27.2	0.278	0.78	54.4	0.00735	0.087	156.1	61.0	44.9	111.2
M200 60min	60	36.5	0.278	0.78	36.5	0.00735	0.058	209.4	122.1	89.7	119.7
M200 2hr	120	48.8	0.278	0.78	24.4	0.00735	0.039	280.0	244.2	179.5	100.5
M200 4hr	240	65.4	0.278	0.78	16.35	0.00735	0.026	375.2	488.4	358.9	16.3
M200 6hr	300	77.6	0.278	0.78	15.52	0.00735	0.025	534.3	732.5	538.4	-4.1
M200 12hr	600	103.9	0.278	0.78	10.39	0.00735	0.017	715.4	1465.1	1076.8	-361.5
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00735	0.011	958.4	2930.2	2153.7	-1195.3
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00735	0.007	1153.3	5860.4	4307.4	-3154.1

Catchment			SP1	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0

M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			SP2	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00280	0.090	27.1	10.2	2.8	24.3
M200 10min	10	17.3	0.278	0.78	103.8	0.00280	0.063	37.8	20.3	5.7	32.1
M200 15min	15	20.3	0.278	0.78	81.2	0.00280	0.049	44.4	30.5	8.5	35.8
M200 30min	30	27.2	0.278	0.78	54.4	0.00280	0.033	59.5	61.0	17.1	42.4
M200 60min	60	36.5	0.278	0.78	36.5	0.00280	0.022	79.8	122.1	34.2	45.6
M200 2hr	120	48.8	0.278	0.78	24.4	0.00280	0.015	106.7	244.2	68.4	38.3
M200 4hr	240	65.4	0.278	0.78	16.35	0.00280	0.010	142.9	488.4	136.7	6.2
M200 6hr	300	77.6	0.278	0.78	15.52	0.00280	0.009	203.5	732.5	205.1	-1.6
M200 12hr	600	103.9	0.278	0.78	10.39	0.00280	0.006	272.5	1465.1	410.2	-137.7
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00280	0.004	365.1	2930.2	820.5	-455.3
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00280	0.003	439.3	5860.4	1640.9	-1201.6

Catchment			SP2	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**

6226 Inch: re WF

M200 5min	5	12.4	0.278	0.6	148.8	0.00320	0.079	23.8	10.2	3.3	20.6
M200 10min	10	17.3	0.278	0.6	103.8	0.00320	0.055	33.2	20.3	6.5	26.7
M200 15min	15	20.3	0.278	0.6	81.2	0.00320	0.043	39.0	30.5	9.8	29.2
M200 30min	30	27.2	0.278	0.6	54.4	0.00320	0.029	52.3	61.0	19.5	32.7
M200 60min	60	36.5	0.278	0.6	36.5	0.00320	0.019	70.1	122.1	39.1	31.1
M200 2hr	120	48.8	0.278	0.6	24.4	0.00320	0.013	93.8	244.2	78.1	15.6
M200 4hr	240	65.4	0.278	0.6	16.35	0.00320	0.009	125.7	488.4	156.3	-30.6
M200 6hr	300	77.6	0.278	0.6	15.52	0.00320	0.008	178.9	732.5	234.4	-55.5
M200 12hr	600	103.9	0.278	0.6	10.39	0.00320	0.006	239.6	1465.1	468.8	-229.3
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00320	0.004	321.0	2930.2	937.7	-616.7
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00320	0.002	386.2	5860.4	1875.3	-1489.1

Catchment			**SP3**	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00335	0.108	32.4	10.2	3.4	29.0
M200 10min	10	17.3	0.278	0.78	103.8	0.00335	0.075	45.2	20.3	6.8	38.4
M200 15min	15	20.3	0.278	0.78	81.2	0.00335	0.059	53.1	30.5	10.2	42.9
M200 30min	30	27.2	0.278	0.78	54.4	0.00335	0.040	71.1	61.0	20.5	50.7
M200 60min	60	36.5	0.278	0.78	36.5	0.00335	0.027	95.5	122.1	40.9	54.6
M200 2hr	120	48.8	0.278	0.78	24.4	0.00335	0.018	127.6	244.2	81.8	45.8
M200 4hr	240	65.4	0.278	0.78	16.35	0.00335	0.012	171.0	488.4	163.6	7.4
M200 6hr	300	77.6	0.278	0.78	15.52	0.00335	0.011	243.5	732.5	245.4	-1.9
M200 12hr	600	103.9	0.278	0.78	10.39	0.00335	0.008	326.0	1465.1	490.8	-164.8

M200 24hr	1200	139.2	0.278	0.78	6.96	0.00335	0.005	436.8	2930.2	981.6	-544.8
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00335	0.003	525.6	5860.4	1963.2	-1437.6

Catchment			SP3	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			SP4	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00800	0.258	77.4	10.2	8.1	69.3
M200 10min	10	17.3	0.278	0.78	103.8	0.00800	0.180	108.0	20.3	16.3	91.8

M200 15min	15	20.3	0.278	0.78	81.2	0.00800	0.141	126.8	30.5	24.4	102.4
M200 30min	30	27.2	0.278	0.78	54.4	0.00800	0.094	169.9	61.0	48.8	121.0
M200 60min	60	36.5	0.278	0.78	36.5	0.00800	0.063	227.9	122.1	97.7	130.3
M200 2hr	120	48.8	0.278	0.78	24.4	0.00800	0.042	304.8	244.2	195.3	109.4
M200 4hr	240	65.4	0.278	0.78	16.35	0.00800	0.028	408.4	488.4	390.7	17.7
M200 6hr	300	77.6	0.278	0.78	15.52	0.00800	0.027	581.5	732.5	586.0	-4.5
M200 12hr	600	103.9	0.278	0.78	10.39	0.00800	0.018	778.6	1465.1	1172.1	-393.5
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00800	0.012	1043.2	2930.2	2344.2	-1301.0
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00800	0.007	1255.2	5860.4	4688.3	-3433.1

Catchment			**SP4**	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			SP5	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.78	148.8	0.01023	0.330	99.0	10.2	10.4	88.6
M200 10min	10	17.3	0.278	0.78	103.8	0.01023	0.230	138.2	20.3	20.8	117.3
M200 15min	15	20.3	0.278	0.78	81.2	0.01023	0.180	162.1	30.5	31.2	130.9
M200 30min	30	27.2	0.278	0.78	54.4	0.01023	0.121	217.2	61.0	62.4	154.8
M200 60min	60	36.5	0.278	0.78	36.5	0.01023	0.081	291.5	122.1	124.9	166.6
M200 2hr	120	48.8	0.278	0.78	24.4	0.01023	0.054	389.7	244.2	249.8	139.9
M200 4hr	240	65.4	0.278	0.78	16.35	0.01023	0.036	522.3	488.4	499.6	22.7
M200 6hr	300	77.6	0.278	0.78	15.52	0.01023	0.034	743.6	732.5	749.4	-5.8
M200 12hr	600	103.9	0.278	0.78	10.39	0.01023	0.023	995.7	1465.1	1498.8	-503.1
M200 24hr	1200	139.2	0.278	0.78	6.96	0.01023	0.015	1333.9	2930.2	2997.6	-1663.6
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.01023	0.009	1605.1	5860.4	5995.2	-4390.0

Catchment			SP5	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00170	0.042	12.7	10.2	1.7	10.9
M200 10min	10	17.3	0.278	0.6	103.8	0.00170	0.029	17.7	20.3	3.5	14.2
M200 15min	15	20.3	0.278	0.6	81.2	0.00170	0.023	20.7	30.5	5.2	15.5

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M200 30min	30	27.2	0.278	0.6	54.4	0.00170	0.015	27.8	61.0	10.4	17.4
M200 60min	60	36.5	0.278	0.6	36.5	0.00170	0.010	37.3	122.1	20.8	16.5
M200 2hr	120	48.8	0.278	0.6	24.4	0.00170	0.007	49.8	244.2	41.5	8.3
M200 4hr	240	65.4	0.278	0.6	16.35	0.00170	0.005	66.8	488.4	83.0	-16.3
M200 6hr	300	77.6	0.278	0.6	15.52	0.00170	0.004	95.1	732.5	124.5	-29.5
M200 12hr	600	103.9	0.278	0.6	10.39	0.00170	0.003	127.3	1465.1	249.1	-121.8
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00170	0.002	170.5	2930.2	498.1	-327.6
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00170	0.001	205.2	5860.4	996.3	-791.1

Catchment			SP6	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00314	0.101	30.4	10.2	3.2	27.2
M200 10min	10	17.3	0.278	0.78	103.8	0.00314	0.071	42.4	20.3	6.4	36.0
M200 15min	15	20.3	0.278	0.78	81.2	0.00314	0.055	49.8	30.5	9.6	40.2
M200 30min	30	27.2	0.278	0.78	54.4	0.00314	0.037	66.7	61.0	19.2	47.5
M200 60min	60	36.5	0.278	0.78	36.5	0.00314	0.025	89.5	122.1	38.3	51.1
M200 2hr	120	48.8	0.278	0.78	24.4	0.00314	0.017	119.6	244.2	76.7	42.9
M200 4hr	240	65.4	0.278	0.78	16.35	0.00314	0.011	160.3	488.4	153.3	7.0
M200 6hr	300	77.6	0.278	0.78	15.52	0.00314	0.011	228.3	732.5	230.0	-1.8
M200 12hr	600	103.9	0.278	0.78	10.39	0.00314	0.007	305.6	1465.1	460.0	-154.4
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00314	0.005	409.4	2930.2	920.1	-510.6
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00314	0.003	492.7	5860.4	1840.2	-1347.5

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Catchment			SP6	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00170	0.042	12.7	10.2	1.7	10.9
M200 10min	10	17.3	0.278	0.6	103.8	0.00170	0.029	17.7	20.3	3.5	14.2
M200 15min	15	20.3	0.278	0.6	81.2	0.00170	0.023	20.7	30.5	5.2	15.5
M200 30min	30	27.2	0.278	0.6	54.4	0.00170	0.015	27.8	61.0	10.4	17.4
M200 60min	60	36.5	0.278	0.6	36.5	0.00170	0.010	37.3	122.1	20.8	16.5
M200 2hr	120	48.8	0.278	0.6	24.4	0.00170	0.007	49.8	244.2	41.5	8.3
M200 4hr	240	65.4	0.278	0.6	16.35	0.00170	0.005	66.8	488.4	83.0	-16.3
M200 6hr	300	77.6	0.278	0.6	15.52	0.00170	0.004	95.1	732.5	124.5	-29.5
M200 12hr	600	103.9	0.278	0.6	10.39	0.00170	0.003	127.3	1465.1	249.1	-121.8
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00170	0.002	170.5	2930.2	498.1	-327.6
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00170	0.001	205.2	5860.4	996.3	-791.1

Catchment			SP7	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00630	0.203	61.0	10.2	6.4	54.6
M200 10min	10	17.3	0.278	0.78	103.8	0.00630	0.142	85.1	20.3	12.8	72.3
M200 15min	15	20.3	0.278	0.78	81.2	0.00630	0.111	99.8	30.5	19.2	80.6
M200 30min	30	27.2	0.278	0.78	54.4	0.00630	0.074	133.8	61.0	38.5	95.3
M200 60min	60	36.5	0.278	0.78	36.5	0.00630	0.050	179.5	122.1	76.9	102.6

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M200 2hr	120	48.8	0.278	0.78	24.4	0.00630	0.033	240.0	244.2	153.8	86.2
M200 4hr	240	65.4	0.278	0.78	16.35	0.00630	0.022	321.6	488.4	307.7	14.0
M200 6hr	300	77.6	0.278	0.78	15.52	0.00630	0.021	458.0	732.5	461.5	-3.5
M200 12hr	600	103.9	0.278	0.78	10.39	0.00630	0.014	613.2	1465.1	923.0	-309.8
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00630	0.010	821.5	2930.2	1846.0	-1024.5
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00630	0.006	988.5	5860.4	3692.1	-2703.5

Catchment			**SP7**	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**I (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00370	0.092	27.6	10.2	3.8	23.8
M200 10min	10	17.3	0.278	0.6	103.8	0.00370	0.064	38.4	20.3	7.5	30.9
M200 15min	15	20.3	0.278	0.6	81.2	0.00370	0.050	45.1	30.5	11.3	33.8
M200 30min	30	27.2	0.278	0.6	54.4	0.00370	0.034	60.4	61.0	22.6	37.8
M200 60min	60	36.5	0.278	0.6	36.5	0.00370	0.023	81.1	122.1	45.2	35.9
M200 2hr	120	48.8	0.278	0.6	24.4	0.00370	0.015	108.4	244.2	90.3	18.1
M200 4hr	240	65.4	0.278	0.6	16.35	0.00370	0.010	145.3	488.4	180.7	-35.4
M200 6hr	300	77.6	0.278	0.6	15.52	0.00370	0.010	206.9	732.5	271.0	-64.2
M200 12hr	600	103.9	0.278	0.6	10.39	0.00370	0.006	277.0	1465.1	542.1	-265.1
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00370	0.004	371.1	2930.2	1084.2	-713.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00370	0.003	446.6	5860.4	2168.3	-1721.8

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Catchment			SP8	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00695	0.224	67.3	10.2	7.1	60.2
M200 10min	10	17.3	0.278	0.78	103.8	0.00695	0.156	93.9	20.3	14.1	79.7
M200 15min	15	20.3	0.278	0.78	81.2	0.00695	0.122	110.1	30.5	21.2	88.9
M200 30min	30	27.2	0.278	0.78	54.4	0.00695	0.082	147.6	61.0	42.4	105.1
M200 60min	60	36.5	0.278	0.78	36.5	0.00695	0.055	198.0	122.1	84.9	113.2
M200 2hr	120	48.8	0.278	0.78	24.4	0.00695	0.037	264.8	244.2	169.7	95.0
M200 4hr	240	65.4	0.278	0.78	16.35	0.00695	0.025	354.8	488.4	339.4	15.4
M200 6hr	300	77.6	0.278	0.78	15.52	0.00695	0.023	505.2	732.5	509.1	-3.9
M200 12hr	600	103.9	0.278	0.78	10.39	0.00695	0.016	676.4	1465.1	1018.2	-341.8
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00695	0.010	906.2	2930.2	2036.5	-1130.2
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00695	0.006	1090.5	5860.4	4073.0	-2982.5

Catchment			SP8	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0

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M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			SP9	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00595	0.192	57.6	10.2	6.1	51.5
M200 10min	10	17.3	0.278	0.78	103.8	0.00595	0.134	80.4	20.3	12.1	68.2
M200 15min	15	20.3	0.278	0.78	81.2	0.00595	0.105	94.3	30.5	18.2	76.1
M200 30min	30	27.2	0.278	0.78	54.4	0.00595	0.070	126.3	61.0	36.3	90.0
M200 60min	60	36.5	0.278	0.78	36.5	0.00595	0.047	169.5	122.1	72.6	96.9
M200 2hr	120	48.8	0.278	0.78	24.4	0.00595	0.031	226.7	244.2	145.3	81.4
M200 4hr	240	65.4	0.278	0.78	16.35	0.00595	0.021	303.8	488.4	290.6	13.2
M200 6hr	300	77.6	0.278	0.78	15.52	0.00595	0.020	432.5	732.5	435.9	-3.4
M200 12hr	600	103.9	0.278	0.78	10.39	0.00595	0.013	579.1	1465.1	871.7	-292.6
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00595	0.009	775.9	2930.2	1743.5	-967.6
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00595	0.005	933.6	5860.4	3486.9	-2553.3

Catchment			SP9	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**

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M200 5min	5	12.4	0.278	0.6	148.8	0.00170	0.042	12.7	10.2	1.7	10.9
M200 10min	10	17.3	0.278	0.6	103.8	0.00170	0.029	17.7	20.3	3.5	14.2
M200 15min	15	20.3	0.278	0.6	81.2	0.00170	0.023	20.7	30.5	5.2	15.5
M200 30min	30	27.2	0.278	0.6	54.4	0.00170	0.015	27.8	61.0	10.4	17.4
M200 60min	60	36.5	0.278	0.6	36.5	0.00170	0.010	37.3	122.1	20.8	16.5
M200 2hr	120	48.8	0.278	0.6	24.4	0.00170	0.007	49.8	244.2	41.5	8.3
M200 4hr	240	65.4	0.278	0.6	16.35	0.00170	0.005	66.8	488.4	83.0	-16.3
M200 6hr	300	77.6	0.278	0.6	15.52	0.00170	0.004	95.1	732.5	124.5	-29.5
M200 12hr	600	103.9	0.278	0.6	10.39	0.00170	0.003	127.3	1465.1	249.1	-121.8
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00170	0.002	170.5	2930.2	498.1	-327.6
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00170	0.001	205.2	5860.4	996.3	-791.1

Catchment			**SP10**	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00810	0.261	78.4	10.2	8.2	70.2
M200 10min	10	17.3	0.278	0.78	103.8	0.00810	0.182	109.4	20.3	16.5	92.9
M200 15min	15	20.3	0.278	0.78	81.2	0.00810	0.143	128.4	30.5	24.7	103.6
M200 30min	30	27.2	0.278	0.78	54.4	0.00810	0.096	172.0	61.0	49.4	122.5
M200 60min	60	36.5	0.278	0.78	36.5	0.00810	0.064	230.8	122.1	98.9	131.9
M200 2hr	120	48.8	0.278	0.78	24.4	0.00810	0.043	308.6	244.2	197.8	110.8
M200 4hr	240	65.4	0.278	0.78	16.35	0.00810	0.029	413.5	488.4	395.6	18.0
M200 6hr	300	77.6	0.278	0.78	15.52	0.00810	0.027	588.8	732.5	593.4	-4.6
M200 12hr	600	103.9	0.278	0.78	10.39	0.00810	0.018	788.4	1465.1	1186.7	-398.4

M200 24hr	1200	139.2	0.278	0.78	6.96	0.00810	0.012	1056.2	2930.2	2373.5	-1317.3
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00810	0.007	1270.9	5860.4	4746.9	-3476.0

Catchment			SP10	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00170	0.042	12.7	10.2	1.7	10.9
M200 10min	10	17.3	0.278	0.6	103.8	0.00170	0.029	17.7	20.3	3.5	14.2
M200 15min	15	20.3	0.278	0.6	81.2	0.00170	0.023	20.7	30.5	5.2	15.5
M200 30min	30	27.2	0.278	0.6	54.4	0.00170	0.015	27.8	61.0	10.4	17.4
M200 60min	60	36.5	0.278	0.6	36.5	0.00170	0.010	37.3	122.1	20.8	16.5
M200 2hr	120	48.8	0.278	0.6	24.4	0.00170	0.007	49.8	244.2	41.5	8.3
M200 4hr	240	65.4	0.278	0.6	16.35	0.00170	0.005	66.8	488.4	83.0	-16.3
M200 6hr	300	77.6	0.278	0.6	15.52	0.00170	0.004	95.1	732.5	124.5	-29.5
M200 12hr	600	103.9	0.278	0.6	10.39	0.00170	0.003	127.3	1465.1	249.1	-121.8
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00170	0.002	170.5	2930.2	498.1	-327.6
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00170	0.001	205.2	5860.4	996.3	-791.1

Catchment			SP11	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00340	0.110	32.9	10.2	3.5	29.5
M200 10min	10	17.3	0.278	0.78	103.8	0.00340	0.077	45.9	20.3	6.9	39.0

M200 15min	15	20.3	0.278	0.78	81.2	0.00340	0.060	53.9	30.5	10.4	43.5
M200 30min	30	27.2	0.278	0.78	54.4	0.00340	0.040	72.2	61.0	20.8	51.4
M200 60min	60	36.5	0.278	0.78	36.5	0.00340	0.027	96.9	122.1	41.5	55.4
M200 2hr	120	48.8	0.278	0.78	24.4	0.00340	0.018	129.5	244.2	83.0	46.5
M200 4hr	240	65.4	0.278	0.78	16.35	0.00340	0.012	173.6	488.4	166.0	7.5
M200 6hr	300	77.6	0.278	0.78	15.52	0.00340	0.011	247.2	732.5	249.1	-1.9
M200 12hr	600	103.9	0.278	0.78	10.39	0.00340	0.008	330.9	1465.1	498.1	-167.2
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00340	0.005	443.3	2930.2	996.3	-552.9
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00340	0.003	533.5	5860.4	1992.5	-1459.1

Catchment			**SP11**	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			SP12	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00043	0.014	4.1	10.2	0.4	3.7
M200 10min	10	17.3	0.278	0.78	103.8	0.00043	0.010	5.7	20.3	0.9	4.9
M200 15min	15	20.3	0.278	0.78	81.2	0.00043	0.007	6.7	30.5	1.3	5.4
M200 30min	30	27.2	0.278	0.78	54.4	0.00043	0.005	9.0	61.0	2.6	6.4
M200 60min	60	36.5	0.278	0.78	36.5	0.00043	0.003	12.1	122.1	5.2	6.9
M200 2hr	120	48.8	0.278	0.78	24.4	0.00043	0.002	16.2	244.2	10.4	5.8
M200 4hr	240	65.4	0.278	0.78	16.35	0.00043	0.002	21.7	488.4	20.8	0.9
M200 6hr	300	77.6	0.278	0.78	15.52	0.00043	0.001	30.9	732.5	31.1	-0.2
M200 12hr	600	103.9	0.278	0.78	10.39	0.00043	0.001	41.4	1465.1	62.3	-20.9
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00043	0.001	55.4	2930.2	124.5	-69.1
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00043	0.000	66.7	5860.4	249.1	-182.4

Catchment			SP12	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0

M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			**SP13**	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00047	0.015	4.5	10.2	0.5	4.0
M200 10min	10	17.3	0.278	0.78	103.8	0.00047	0.010	6.3	20.3	0.9	5.3
M200 15min	15	20.3	0.278	0.78	81.2	0.00047	0.008	7.4	30.5	1.4	5.9
M200 30min	30	27.2	0.278	0.78	54.4	0.00047	0.005	9.9	61.0	2.8	7.0
M200 60min	60	36.5	0.278	0.78	36.5	0.00047	0.004	13.2	122.1	5.7	7.6
M200 2hr	120	48.8	0.278	0.78	24.4	0.00047	0.002	17.7	244.2	11.4	6.4
M200 4hr	240	65.4	0.278	0.78	16.35	0.00047	0.002	23.7	488.4	22.7	1.0
M200 6hr	300	77.6	0.278	0.78	15.52	0.00047	0.002	33.8	732.5	34.1	-0.3
M200 12hr	600	103.9	0.278	0.78	10.39	0.00047	0.001	45.3	1465.1	68.1	-22.9
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00047	0.001	60.6	2930.2	136.3	-75.6
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00047	0.000	73.0	5860.4	272.5	-199.5

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Catchment			SP13	Hardstand					water discharge rate (l/s) 33.91		l/s/ha
Clean water natural flow											
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			SP14	Area Excl Hardstand					water discharge rate (l/s) 33.91		l/s/ha
Clean water natural flow											
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00355	0.114	34.3	10.2	3.6	30.7
M200 10min	10	17.3	0.278	0.78	103.8	0.00355	0.080	47.9	20.3	7.2	40.7
M200 15min	15	20.3	0.278	0.78	81.2	0.00355	0.062	56.2	30.5	10.8	45.4
M200 30min	30	27.2	0.278	0.78	54.4	0.00355	0.042	75.3	61.0	21.6	53.6
M200 60min	60	36.5	0.278	0.78	36.5	0.00355	0.028	101.0	122.1	43.3	57.7

M200 2hr	120	48.8	0.278	0.78	24.4	0.00355	0.019	135.0	244.2	86.6	48.5
M200 4hr	240	65.4	0.278	0.78	16.35	0.00355	0.013	181.0	488.4	173.1	7.9
M200 6hr	300	77.6	0.278	0.78	15.52	0.00355	0.012	257.7	732.5	259.7	-2.0
M200 12hr	600	103.9	0.278	0.78	10.39	0.00355	0.008	345.0	1465.1	519.4	-174.3
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00355	0.005	462.3	2930.2	1038.8	-576.5
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00355	0.003	556.2	5860.4	2077.5	-1521.3

Catchment			SP14	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			SP15	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**

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M200 5min	5	12.4	0.278	0.78	148.8	0.00803	0.259	77.7	10.2	8.2	69.5
M200 10min	10	17.3	0.278	0.78	103.8	0.00803	0.181	108.4	20.3	16.3	92.0
M200 15min	15	20.3	0.278	0.78	81.2	0.00803	0.141	127.2	30.5	24.5	102.7
M200 30min	30	27.2	0.278	0.78	54.4	0.00803	0.095	170.4	61.0	49.0	121.4
M200 60min	60	36.5	0.278	0.78	36.5	0.00803	0.064	228.7	122.1	98.0	130.7
M200 2hr	120	48.8	0.278	0.78	24.4	0.00803	0.042	305.7	244.2	196.0	109.8
M200 4hr	240	65.4	0.278	0.78	16.35	0.00803	0.028	409.7	488.4	391.9	17.8
M200 6hr	300	77.6	0.278	0.78	15.52	0.00803	0.027	583.4	732.5	587.9	-4.5
M200 12hr	600	103.9	0.278	0.78	10.39	0.00803	0.018	781.1	1465.1	1175.7	-394.7
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00803	0.012	1046.4	2930.2	2351.5	-1305.1
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00803	0.007	1259.2	5860.4	4703.0	-3443.8

Catchment			**SP15**	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00320	0.079	23.8	10.2	3.3	20.6
M200 10min	10	17.3	0.278	0.6	103.8	0.00320	0.055	33.2	20.3	6.5	26.7
M200 15min	15	20.3	0.278	0.6	81.2	0.00320	0.043	39.0	30.5	9.8	29.2
M200 30min	30	27.2	0.278	0.6	54.4	0.00320	0.029	52.3	61.0	19.5	32.7
M200 60min	60	36.5	0.278	0.6	36.5	0.00320	0.019	70.1	122.1	39.1	31.1
M200 2hr	120	48.8	0.278	0.6	24.4	0.00320	0.013	93.8	244.2	78.1	15.6
M200 4hr	240	65.4	0.278	0.6	16.35	0.00320	0.009	125.7	488.4	156.3	-30.6
M200 6hr	300	77.6	0.278	0.6	15.52	0.00320	0.008	178.9	732.5	234.4	-55.5
M200 12hr	600	103.9	0.278	0.6	10.39	0.00320	0.006	239.6	1465.1	468.8	-229.3

M200 24hr	1200	139.2	0.278	0.6	6.96	0.00320	0.004	321.0	2930.2	937.7	-616.7
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00320	0.002	386.2	5860.4	1875.3	-1489.1

Catchment			SP16	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00415	0.134	40.2	10.2	4.2	35.9
M200 10min	10	17.3	0.278	0.78	103.8	0.00415	0.093	56.0	20.3	8.4	47.6
M200 15min	15	20.3	0.278	0.78	81.2	0.00415	0.073	65.8	30.5	12.7	53.1
M200 30min	30	27.2	0.278	0.78	54.4	0.00415	0.049	88.1	61.0	25.3	62.8
M200 60min	60	36.5	0.278	0.78	36.5	0.00415	0.033	118.2	122.1	50.7	67.6
M200 2hr	120	48.8	0.278	0.78	24.4	0.00415	0.022	158.1	244.2	101.3	56.8
M200 4hr	240	65.4	0.278	0.78	16.35	0.00415	0.015	211.9	488.4	202.7	9.2
M200 6hr	300	77.6	0.278	0.78	15.52	0.00415	0.014	301.7	732.5	304.0	-2.3
M200 12hr	600	103.9	0.278	0.78	10.39	0.00415	0.009	403.9	1465.1	608.0	-204.1
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00415	0.006	541.1	2930.2	1216.0	-674.9
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00415	0.004	651.2	5860.4	2432.1	-1780.9

Catchment			SP16	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0

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M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			**SP17**	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00474	0.153	45.8	10.2	4.8	41.0
M200 10min	10	17.3	0.278	0.78	103.8	0.00474	0.107	63.9	20.3	9.6	54.3
M200 15min	15	20.3	0.278	0.78	81.2	0.00474	0.083	75.0	30.5	14.5	60.6
M200 30min	30	27.2	0.278	0.78	54.4	0.00474	0.056	100.5	61.0	28.9	71.6
M200 60min	60	36.5	0.278	0.78	36.5	0.00474	0.037	134.9	122.1	57.8	77.1
M200 2hr	120	48.8	0.278	0.78	24.4	0.00474	0.025	180.4	244.2	115.6	64.8
M200 4hr	240	65.4	0.278	0.78	16.35	0.00474	0.017	241.7	488.4	231.2	10.5
M200 6hr	300	77.6	0.278	0.78	15.52	0.00474	0.016	344.2	732.5	346.9	-2.7
M200 12hr	600	103.9	0.278	0.78	10.39	0.00474	0.011	460.8	1465.1	693.7	-232.9
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00474	0.007	617.4	2930.2	1387.4	-770.0
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00474	0.004	742.9	5860.4	2774.9	-2032.0

Catchment			SP17	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			SP18	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00600	0.194	58.1	10.2	6.1	52.0
M200 10min	10	17.3	0.278	0.78	103.8	0.00600	0.135	81.0	20.3	12.2	68.8
M200 15min	15	20.3	0.278	0.78	81.2	0.00600	0.106	95.1	30.5	18.3	76.8
M200 30min	30	27.2	0.278	0.78	54.4	0.00600	0.071	127.4	61.0	36.6	90.8
M200 60min	60	36.5	0.278	0.78	36.5	0.00600	0.047	171.0	122.1	73.3	97.7

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M200 2hr	120	48.8	0.278	0.78	24.4	0.00600	0.032	228.6	244.2	146.5	82.1
M200 4hr	240	65.4	0.278	0.78	16.35	0.00600	0.021	306.3	488.4	293.0	13.3
M200 6hr	300	77.6	0.278	0.78	15.52	0.00600	0.020	436.2	732.5	439.5	-3.4
M200 12hr	600	103.9	0.278	0.78	10.39	0.00600	0.014	584.0	1465.1	879.1	-295.1
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00600	0.009	782.4	2930.2	1758.1	-975.7
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00600	0.005	941.4	5860.4	3516.2	-2574.8

Catchment			**SP18**	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			**SP19**	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**

M200 5min	5	12.4	0.278	0.78	148.8	0.00038	0.012	3.6	10.2	0.4	3.2
M200 10min	10	17.3	0.278	0.78	103.8	0.00038	0.008	5.1	20.3	0.8	4.3
M200 15min	15	20.3	0.278	0.78	81.2	0.00038	0.007	5.9	30.5	1.1	4.8
M200 30min	30	27.2	0.278	0.78	54.4	0.00038	0.004	8.0	61.0	2.3	5.7
M200 60min	60	36.5	0.278	0.78	36.5	0.00038	0.003	10.7	122.1	4.6	6.1
M200 2hr	120	48.8	0.278	0.78	24.4	0.00038	0.002	14.3	244.2	9.2	5.1
M200 4hr	240	65.4	0.278	0.78	16.35	0.00038	0.001	19.1	488.4	18.3	0.8
M200 6hr	300	77.6	0.278	0.78	15.52	0.00038	0.001	27.3	732.5	27.5	-0.2
M200 12hr	600	103.9	0.278	0.78	10.39	0.00038	0.001	36.5	1465.1	54.9	-18.4
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00038	0.001	48.9	2930.2	109.9	-61.0
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00038	0.000	58.8	5860.4	219.8	-160.9

Catchment			**SP19**	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0

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M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			SP20	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00038	0.012	3.6	10.2	0.4	3.2
M200 10min	10	17.3	0.278	0.78	103.8	0.00038	0.008	5.1	20.3	0.8	4.3
M200 15min	15	20.3	0.278	0.78	81.2	0.00038	0.007	5.9	30.5	1.1	4.8
M200 30min	30	27.2	0.278	0.78	54.4	0.00038	0.004	8.0	61.0	2.3	5.7
M200 60min	60	36.5	0.278	0.78	36.5	0.00038	0.003	10.7	122.1	4.6	6.1
M200 2hr	120	48.8	0.278	0.78	24.4	0.00038	0.002	14.3	244.2	9.2	5.1
M200 4hr	240	65.4	0.278	0.78	16.35	0.00038	0.001	19.1	488.4	18.3	0.8
M200 6hr	300	77.6	0.278	0.78	15.52	0.00038	0.001	27.3	732.5	27.5	-0.2
M200 12hr	600	103.9	0.278	0.78	10.39	0.00038	0.001	36.5	1465.1	54.9	-18.4
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00038	0.001	48.9	2930.2	109.9	-61.0
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00038	0.000	58.8	5860.4	219.8	-160.9

Catchment			SP20	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0

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M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			**SP21**	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00140	0.045	13.6	10.2	1.4	12.1
M200 10min	10	17.3	0.278	0.78	103.8	0.00140	0.032	18.9	20.3	2.8	16.1
M200 15min	15	20.3	0.278	0.78	81.2	0.00140	0.025	22.2	30.5	4.3	17.9
M200 30min	30	27.2	0.278	0.78	54.4	0.00140	0.017	29.7	61.0	8.5	21.2
M200 60min	60	36.5	0.278	0.78	36.5	0.00140	0.011	39.9	122.1	17.1	22.8
M200 2hr	120	48.8	0.278	0.78	24.4	0.00140	0.007	53.3	244.2	34.2	19.1
M200 4hr	240	65.4	0.278	0.78	16.35	0.00140	0.005	71.5	488.4	68.4	3.1
M200 6hr	300	77.6	0.278	0.78	15.52	0.00140	0.005	101.8	732.5	102.6	-0.8
M200 12hr	600	103.9	0.278	0.78	10.39	0.00140	0.003	136.3	1465.1	205.1	-68.9
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00140	0.002	182.6	2930.2	410.2	-227.7
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00140	0.001	219.7	5860.4	820.5	-600.8

Catchment			SP21	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			SP22	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00019	0.006	1.9	10.2	0.2	1.7
M200 10min	10	17.3	0.278	0.78	103.8	0.00019	0.004	2.6	20.3	0.4	2.2
M200 15min	15	20.3	0.278	0.78	81.2	0.00019	0.003	3.0	30.5	0.6	2.5
M200 30min	30	27.2	0.278	0.78	54.4	0.00019	0.002	4.1	61.0	1.2	2.9
M200 60min	60	36.5	0.278	0.78	36.5	0.00019	0.002	5.5	122.1	2.3	3.1

M200 2hr	120	48.8	0.278	0.78	24.4	0.00019	0.001	7.3	244.2	4.7	2.6
M200 4hr	240	65.4	0.278	0.78	16.35	0.00019	0.001	9.8	488.4	9.4	0.4
M200 6hr	300	77.6	0.278	0.78	15.52	0.00019	0.001	14.0	732.5	14.1	-0.1
M200 12hr	600	103.9	0.278	0.78	10.39	0.00019	0.000	18.7	1465.1	28.1	-9.4
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00019	0.000	25.0	2930.2	56.3	-31.2
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00019	0.000	30.1	5860.4	112.5	-82.4

Catchment			**SP22**	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			**SP23**	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**

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M200 5min	5	12.4	0.278	0.78	148.8	0.00019	0.006	1.9	10.2	0.2	1.7
M200 10min	10	17.3	0.278	0.78	103.8	0.00019	0.004	2.6	20.3	0.4	2.2
M200 15min	15	20.3	0.278	0.78	81.2	0.00019	0.003	3.0	30.5	0.6	2.5
M200 30min	30	27.2	0.278	0.78	54.4	0.00019	0.002	4.1	61.0	1.2	2.9
M200 60min	60	36.5	0.278	0.78	36.5	0.00019	0.002	5.5	122.1	2.3	3.1
M200 2hr	120	48.8	0.278	0.78	24.4	0.00019	0.001	7.3	244.2	4.7	2.6
M200 4hr	240	65.4	0.278	0.78	16.35	0.00019	0.001	9.8	488.4	9.4	0.4
M200 6hr	300	77.6	0.278	0.78	15.52	0.00019	0.001	14.0	732.5	14.1	-0.1
M200 12hr	600	103.9	0.278	0.78	10.39	0.00019	0.000	18.7	1465.1	28.1	-9.4
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00019	0.000	25.0	2930.2	56.3	-31.2
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00019	0.000	30.1	5860.4	112.5	-82.4

Catchment			**SP23**	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0

M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			SP24	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00067	0.022	6.5	10.2	0.7	5.8
M200 10min	10	17.3	0.278	0.78	103.8	0.00067	0.015	9.1	20.3	1.4	7.7
M200 15min	15	20.3	0.278	0.78	81.2	0.00067	0.012	10.6	30.5	2.1	8.6
M200 30min	30	27.2	0.278	0.78	54.4	0.00067	0.008	14.3	61.0	4.1	10.2
M200 60min	60	36.5	0.278	0.78	36.5	0.00067	0.005	19.1	122.1	8.2	10.9
M200 2hr	120	48.8	0.278	0.78	24.4	0.00067	0.004	25.6	244.2	16.4	9.2
M200 4hr	240	65.4	0.278	0.78	16.35	0.00067	0.002	34.3	488.4	32.8	1.5
M200 6hr	300	77.6	0.278	0.78	15.52	0.00067	0.002	48.8	732.5	49.2	-0.4
M200 12hr	600	103.9	0.278	0.78	10.39	0.00067	0.002	65.4	1465.1	98.5	-33.1
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00067	0.001	87.6	2930.2	196.9	-109.3
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00067	0.001	105.4	5860.4	393.8	-288.4

Catchment			SP24	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0

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M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			**SP25**	Area Excl Hardstand				water discharge rate (l/s)		
Clean water natural flow								33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00463	0.149	44.8	10.2	4.7	40.1
M200 10min	10	17.3	0.278	0.78	103.8	0.00463	0.104	62.5	20.3	9.4	53.1
M200 15min	15	20.3	0.278	0.78	81.2	0.00463	0.082	73.4	30.5	14.1	59.2
M200 30min	30	27.2	0.278	0.78	54.4	0.00463	0.055	98.3	61.0	28.3	70.0
M200 60min	60	36.5	0.278	0.78	36.5	0.00463	0.037	131.9	122.1	56.5	75.4
M200 2hr	120	48.8	0.278	0.78	24.4	0.00463	0.024	176.4	244.2	113.1	63.3
M200 4hr	240	65.4	0.278	0.78	16.35	0.00463	0.016	236.4	488.4	226.1	10.3
M200 6hr	300	77.6	0.278	0.78	15.52	0.00463	0.016	336.6	732.5	339.2	-2.6
M200 12hr	600	103.9	0.278	0.78	10.39	0.00463	0.010	450.6	1465.1	678.3	-227.7
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00463	0.007	603.7	2930.2	1356.7	-753.0
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00463	0.004	726.5	5860.4	2713.4	-1986.9

Catchment			SP25	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00320	0.079	23.8	10.2	3.3	20.6
M200 10min	10	17.3	0.278	0.6	103.8	0.00320	0.055	33.2	20.3	6.5	26.7
M200 15min	15	20.3	0.278	0.6	81.2	0.00320	0.043	39.0	30.5	9.8	29.2
M200 30min	30	27.2	0.278	0.6	54.4	0.00320	0.029	52.3	61.0	19.5	32.7
M200 60min	60	36.5	0.278	0.6	36.5	0.00320	0.019	70.1	122.1	39.1	31.1
M200 2hr	120	48.8	0.278	0.6	24.4	0.00320	0.013	93.8	244.2	78.1	15.6
M200 4hr	240	65.4	0.278	0.6	16.35	0.00320	0.009	125.7	488.4	156.3	-30.6
M200 6hr	300	77.6	0.278	0.6	15.52	0.00320	0.008	178.9	732.5	234.4	-55.5
M200 12hr	600	103.9	0.278	0.6	10.39	0.00320	0.006	239.6	1465.1	468.8	-229.3
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00320	0.004	321.0	2930.2	937.7	-616.7
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00320	0.002	386.2	5860.4	1875.3	-1489.1

Catchment			SP26	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00663	0.214	64.2	10.2	6.7	57.4
M200 10min	10	17.3	0.278	0.78	103.8	0.00663	0.149	89.5	20.3	13.5	76.0
M200 15min	15	20.3	0.278	0.78	81.2	0.00663	0.117	105.1	30.5	20.2	84.8

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M200 30min	30	27.2	0.278	0.78	54.4	0.00663	0.078	140.8	61.0	40.5	100.3
M200 60min	60	36.5	0.278	0.78	36.5	0.00663	0.052	188.9	122.1	80.9	108.0
M200 2hr	120	48.8	0.278	0.78	24.4	0.00663	0.035	252.6	244.2	161.9	90.7
M200 4hr	240	65.4	0.278	0.78	16.35	0.00663	0.024	338.5	488.4	323.8	14.7
M200 6hr	300	77.6	0.278	0.78	15.52	0.00663	0.022	481.9	732.5	485.7	-3.7
M200 12hr	600	103.9	0.278	0.78	10.39	0.00663	0.015	645.3	1465.1	971.4	-326.1
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00663	0.010	864.5	2930.2	1942.7	-1078.2
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00663	0.006	1040.3	5860.4	3885.4	-2845.2

Catchment			**SP26**	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0
M200 2hr	120	48.8	0.278	0.6	24.4	0.00000	0.000	0.0	244.2	0.0	0.0
M200 4hr	240	65.4	0.278	0.6	16.35	0.00000	0.000	0.0	488.4	0.0	0.0
M200 6hr	300	77.6	0.278	0.6	15.52	0.00000	0.000	0.0	732.5	0.0	0.0
M200 12hr	600	103.9	0.278	0.6	10.39	0.00000	0.000	0.0	1465.1	0.0	0.0
M200 24hr	1200	139.2	0.278	0.6	6.96	0.00000	0.000	0.0	2930.2	0.0	0.0
M200 48hr	2400	167.5	0.278	0.6	4.1875	0.00000	0.000	0.0	5860.4	0.0	0.0

Catchment			SP27	Area Excl Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.78	148.8	0.00736	0.237	71.2	10.2	7.5	63.8
M200 10min	10	17.3	0.278	0.78	103.8	0.00736	0.166	99.4	20.3	15.0	84.4
M200 15min	15	20.3	0.278	0.78	81.2	0.00736	0.130	116.6	30.5	22.5	94.2
M200 30min	30	27.2	0.278	0.78	54.4	0.00736	0.087	156.3	61.0	44.9	111.3
M200 60min	60	36.5	0.278	0.78	36.5	0.00736	0.058	209.7	122.1	89.9	119.8
M200 2hr	120	48.8	0.278	0.78	24.4	0.00736	0.039	280.4	244.2	179.7	100.7
M200 4hr	240	65.4	0.278	0.78	16.35	0.00736	0.026	375.7	488.4	359.4	16.3
M200 6hr	300	77.6	0.278	0.78	15.52	0.00736	0.025	535.0	732.5	539.2	-4.1
M200 12hr	600	103.9	0.278	0.78	10.39	0.00736	0.017	716.3	1465.1	1078.3	-362.0
M200 24hr	1200	139.2	0.278	0.78	6.96	0.00736	0.011	959.7	2930.2	2156.6	-1196.9
M200 48hr	2400	167.5	0.278	0.78	4.1875	0.00736	0.007	1154.8	5860.4	4313.3	-3158.4

Catchment			SP27	Hardstand					water discharge rate (l/s)		
Clean water natural flow									33.91		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	12.4	0.278	0.6	148.8	0.00000	0.000	0.0	10.2	0.0	0.0
M200 10min	10	17.3	0.278	0.6	103.8	0.00000	0.000	0.0	20.3	0.0	0.0
M200 15min	15	20.3	0.278	0.6	81.2	0.00000	0.000	0.0	30.5	0.0	0.0
M200 30min	30	27.2	0.278	0.6	54.4	0.00000	0.000	0.0	61.0	0.0	0.0
M200 60min	60	36.5	0.278	0.6	36.5	0.00000	0.000	0.0	122.1	0.0	0.0