HEWITTS CREEK

Incorporating Slacky, Tramway, Woodlands & Thomas Gibson Creeks

FLOODPLAIN RISK MANAGEMENT PLAN

WOLLONGONG
City of Innovation

SLACKY CREEK

S1	Construct a coarse debris trap comprising large steel or timber 'bollards' set into the bed of the creek, bollards to be set at 0.5-1m spacings and span full creek width. Provision to be made for maintenance access.
S2	Remove excess boulders and sediment deposited in the August 1998 flood immediately downstream of Rex Ave. Form waterway of similar capacity to that existing Pre 1998 storm.
S3	Modify downstream handrail & headwall structure elevate driveway entrance to No's 21 to 25; & lower kerb. Remove sandstone blockwork obstructing entrance to culvert.
S4	Excavate creek banks to reduce batter, widen where possible. Provide rock armour bank protection as required.
S5	Excavate sediment basin of minimum 2000 m3 volume, offline to creek, include provision for maintenance access.
S6	Modify the access road embankment including provision of a PMF safe spillway & clay lining of upstream faces. Optimisation of basin outlet by reducing outlet size. Provide a debris control structure upstream of basin outlet.
S7	Remove twin 1800 dia. culvert & access road immediately downstream of Hobart St; Construct debris control structure; & regrade Hobart St, between the Slacky Creek culvert & Haig Rd.
S8	Partially fill the northern basin outlet to elevate overtopping level. Construct flow training walls upstream of main culvert to improve hydraulic characteristics.
S9	Construct a flow training wall at RL 4.00m (approx) along the rear boundary of properties on the south bank to reduce breakout of flow. Levee to extend downstream from No 16 Hutton Ave. (final extent to be determined at detail design stage).
S10	Implement an opening policy requiring Council to clear sand from the creek outlet once a critical level (RL 2.8m) of sand "build up" is reached.
S11	Owner of Old Bulli Mine site to expedite rehabilitation works including stabilization of mine platform.

TRAMWAY CREEK

T1	Construct grass lined swale along Hobart St. (south side) to provide overland flow path. Lower Haig Rd. roundabout. Swale to extend between culvert proposed at Highway (refer T2) & Slacky Creek diversion (refer S7)
T2	Construct a (6m min.diagonal opening) culvert beneath the Highway (adjacent Hobart St. intersection) to connect the overland flow path at T4 to swale at T1. Provision to be made for debris control on the upstream side.
T3	Purchase properties at eastern end of Hobart St (No's 177 & 171-175), demolish &/or remove all structures to facilitate construction of overland flow path between Princes Highway & Tramway Creek (refer T4)
T4	Construct an overland flow path between the Highway (opposite Hobart St) & Tramway Creek (to the rear of 19 Allenby Pde). Construction to include enlargement of existing channel & excavation of a new channel (where required)
T5	Construct a new high level culvert through the railway embankement, 6m wide by 4m high,to the south of the existing low level culvert.
T6	Implement an opening policy requiring Council to clear sand from the creek outlet once a critical level (RL 2.8m) of sand "build up" is reached.

ALL CATCHMENTS

(refer study for more details)

- Implementation of Development Control Plan (DCP) to ensure all future development is compatible with flooding risks.
- Minimum width overflow paths & riparian setbacks for all development adjoining creeks & natural low points.
- Minimum requirements for floor levels & safe access to be elevated above flood levels.
- All new development to incorporate flood compatible structures including flood proof materials & fencing.
- Council to undertake an education & flood awareness program to raise general awareness of flooding behaviour in the local area. This may include flood signage, information leaflets & newspaper articles.
- All data collected and processed in this study be provided to the State Emergency Service (SES) by Wollongong City Council in a format suitable for interpretation by the SES as soon as it is available, for incorporation into the "Wollongong City Local Flood Plan".
- A Riparian Management Study be undertaken within the study area to identify possible sources of sediment, areas of general channel and bank instability and opportunities for improving the overall riparian corridor with the associated benefit of reducing wherever possible the potential for future debris mobilisation.

SUMMARY OF PROPERTIES PROTECTED - RECOMMENDED SCHEME

Creek	No. of Properties Protected: 20% AEP Yard	20% AEP Above Floor	5% AEP Yard	5% AEP Above Floor	2% AEP Yard	2% AEP Above Floor	1% AEP Yard	1% AEP Above Floor	PMF Yard	PMF Above Floor
TOTAL	8	6	91	57	91	59	71	48	42	12
Slacky	0	0	27	1	27	1	27	1	25	1
Tramway	0	0	10	10	11	10	11	11	8	3
Woodlands	0	0	5	4	5	5	5	5	1	0
Hewitts	6	4	48	35	47	39	27	29	8	5
Hewitts (Stream 4)	0	0	0	1	0	1	0	0	0	0
Thomas Gibson	2	2	1	6	2	3	1	2	0	3

SUMMARY OF FINANCIAL BENEFITS - RECOMMENDED SCHEME

Creek	Scheme	Total Damages ($AAD)	Total Benefits $AAD	Total Benefits $NPV	Scheme Cost ($)	Benefit Cost Ratio
TOTAL		$568,750	$429,000	$11,101,907	$8,900,000	1.2
Slacky/ Tramway	SB/TB1	8,750	80,000	2,072,458	3,990,000	0.5
Woodlands/ Hewitts	WA/HA	162,750	241,000	6,290,070	2,800,000	2.2
Hewitts (Stream 4)	HS4A	54,250	39,000	994,378	260,000	3.8
Thomas Gibson	TGB	343,000	69,000	1,745,001	1,850,000	0.9

HEWITTS CREEK

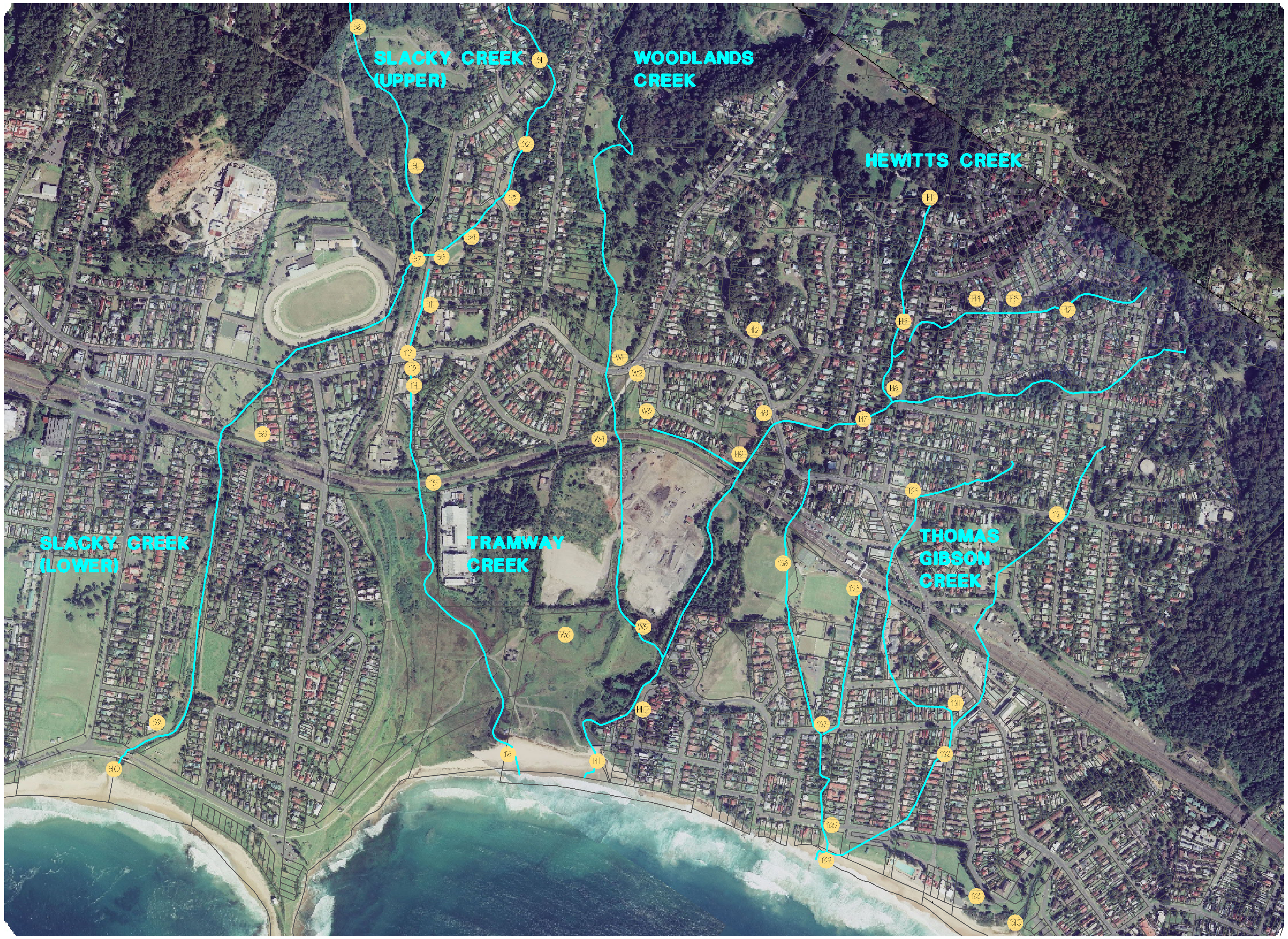
H1	Construct a coarse debris trap comprising large steel or timber 'bollards' set into the bed of the creek, bollards to be set at 0.5-1m spacings and span full creek width. Provision to be made for maintenance access.
H2	Construct a coarse debris trap comprising large steel or timber 'bollards' set into the bed of the creek, bollards to be set at 0.5-1m spacings and span full creek width. Provision to be made for maintenance access.
H3	Construct expanded inlet & debris control structure at culvert entrance & modify local drainage to prevent surcharge of pits (in front of No 25 Virginia Terrace). Rehabilitate creek channel upstream of culvert.
H4	Modify driveway entrance to No's 23 & 25 Virginia Terrace. Provide flood compatible fencing & relocate structures within overflow path. Flow training walls as necessary to protect properties.
H5	Remove excess boulders and sediment deposited in the August 1998 flood upstream of Kelton Lane. Stabilise creek banks.
H6	Excavate & enlarge creek channel & construct low levee at rear of properties in Lachlan St. to contain flows. Construct rock revetment at toe of unstable bank at rear of No 19 George St. Landscape all areas upon completion.
H7	Lower kerb & raise driveways on downstream edge of Lachlan St. (between No 6 & No 14). Construct projecting central pillar & flow training walls.
H8	Make voluntary purchase offer for No 419 Lawrence Hargrave Drive.
H9	Close access road, reconstruct creek channel between Lawrence Hargrave Dr & the rail. Reinstate natural rock pools & ripples; construction of an offline water quality control pond & sediment trap on south bank. Landscape on completion.
H10	Construct a levee at RL 4.50m (approx) along the rear boundary of properies on the north bank. Levee to extend downstream from No 17 Corbett Ave. Levee to comprise combination of earth & masonry wall. Final extent to be determined at detail design stage.
H11	Implement an opening policy requiring Council to clear sand from the creek outlet once a critical level (RL 2.8m) of sand "build up" is reached.
H12	Council to further investigate flood/ stormwater issues within the vicinity of Pass Avenue and High Street.

WOODLANDS CREEK

W1	Excavate basin of minimum 3000m3 volume, offline to creek including provision for water quality controls & landscaping with native species. Incorporate debris control structure upstream of Princes Highway culvert.
W2	Lower safety ramp by approx. 1.0m for a distance of 50m from the entry to the ramp. Excess spoil to be used for construction of levee (refer W3)
W3	Construct a levee at RL 18.50m (approx) along the rear boundary of properties on the north bank. Levee to extend between Lawrence Hargrave Drive & the railway embankment.
W4	Construct a new high level culvert through the railway embankement, 6m wide by 4m high to the north of the existing low level culvert.
W5	Close off diversion of Woodlands into Hewitts by filling existing gabion lined channel using appropriate fill material. Landscape on completion.
W6	Upgrade existing flow path to Tramway Creek by excavating an enlarged channel (where required) providing rock armour bank protection. Landscape on completion.

THOMAS GIBSON CREEK

TG1	Construct a new pipe system with multiple inlets along east side of Phillip St. Construct new "natural" watercourse along Sea Foam Ave. Raise kerb & driveways of properties in Sea Foam Ave. (No's 29-33)
TG2	Raise kerb & driveway entrances along south side of Bath St by 150mm approx. to contain minor flooding within roadway.
TG3	Lower the south bank of Flanagans Creek by up to 1m near bend in The Esplanade. Rehabilitate steep eroding banks. Enlarge table drain along east side of The Esplanade to enhance capacity.
TG4	Modify the entrance to public car park to provide for overflow. Raise kerb & driveways to protect low lying properties. (No's 101 to 105)
TG5	Modify Station St to provide one-way cross fall to south. Enlarge southern table drain to convey major flows towards playing field & into proposed detention basin. Investigate improvements to rail culvert near War Memorial.
TG6	Enlarge & strengthen existing embankment at east end of Thomas Gibson Park. Provide new outlet structure & reinforced spillway to formalise as detention basin. Remove existing diversion into Thomas Gibson Park at Lachlan St (near Uniting Church)
TG7	Modify the inlet to the Macauley St culvert by constructing tapered inlet to enhance hydraulic capacity. Modify watercourse downstream of culvert to enhance capacity. Relocate structures as necessary.
TG8	Improve culvert capacity by constructing an additional culvert or enhancing capacity of existing system. Modify roadway & existing floodgate to reduce diversion northwards to Bath St.
TG9	Implement an opening policy requiring Council to clear sand from the creek outlet once a critical level (RL 2.8m) of sand "build up" is reached.
TG10	Implement an opening policy requiring Council to clear sand from the creek outlet once a critical level (RL 2.8m) of sand "build up" is reached.
TG11	Carry out investigation to determine the capacity & condition of existing drainage infrastructure in the general area. Carry out any improvements determined necessary.



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