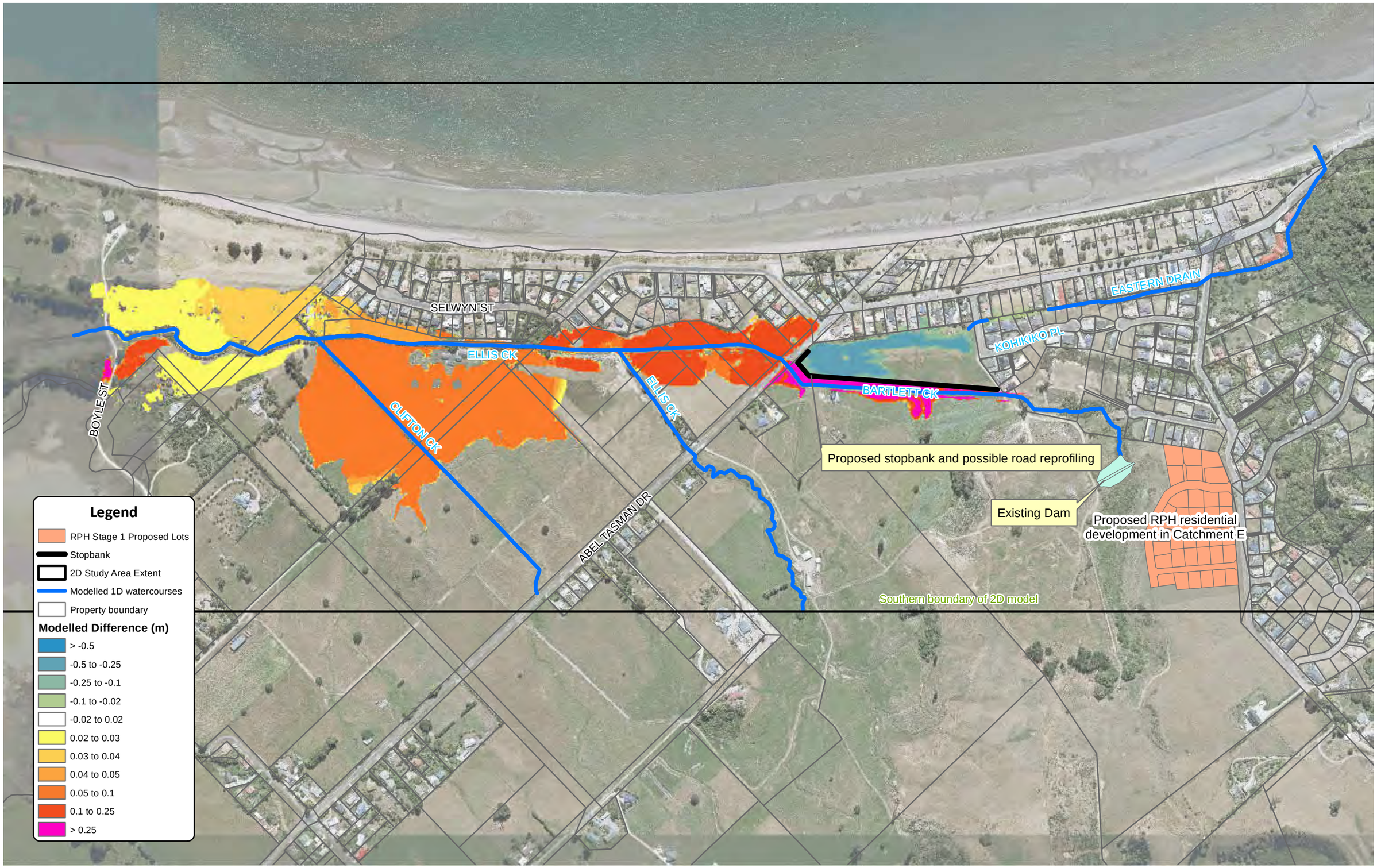
Appendix H: Difference maps – Proposed RPH Development Improvements

- Figure H1 – Flood differences – present day 10% AEP
- Figure H2 – Flood differences – present day 1% AEP
- Figure H3 – Flood differences – 2100 10% AEP
- Figure H4 – Flood differences – 2100 1% AEP



Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000

0 60 120 180 240 300 Meters

N

Location Plan

Tonkin+Taylor
51 Halifax Street, Nelson
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DRAWN	TZHL	Sep.16
CHECKED	DMN	Sept16
APPROVED		Sept 16
ARCFILE	Figure H1.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	

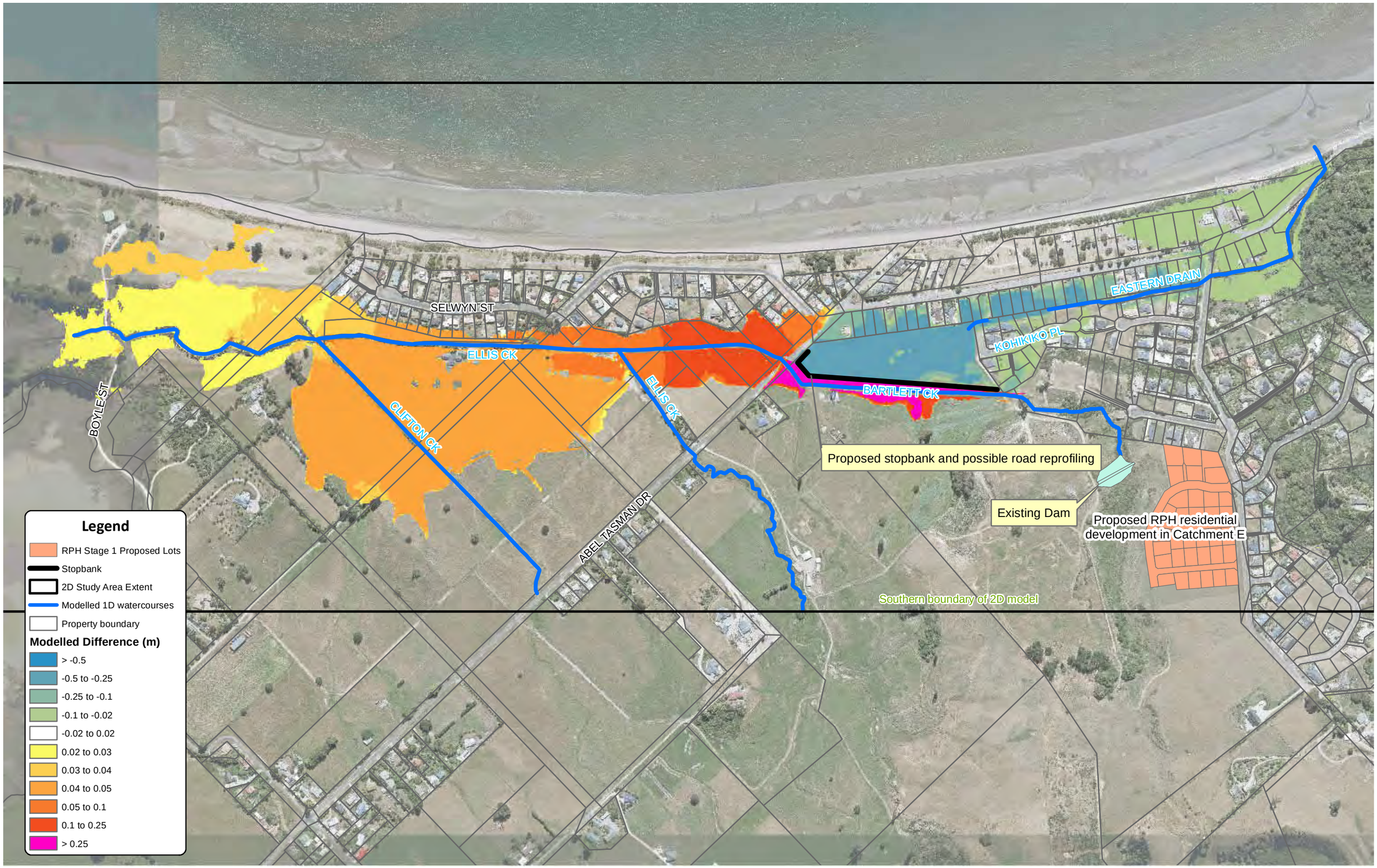
TASMAN DISTRICT COUNCIL

POHARA STORMWATER OPTIONS ASSESSMENT
RPH IMPROVEMENTS

Modelled Difference in Flood Depths for Present Day 10% AEP

FIGURE No. Figure H1 Rev. 0

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURES\V01\Figure H1.mxd Date: 16/09/2016 Time: 2:30:49 p.m.



Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000
0 60 120 180 240 300 Meters

N

Location Plan

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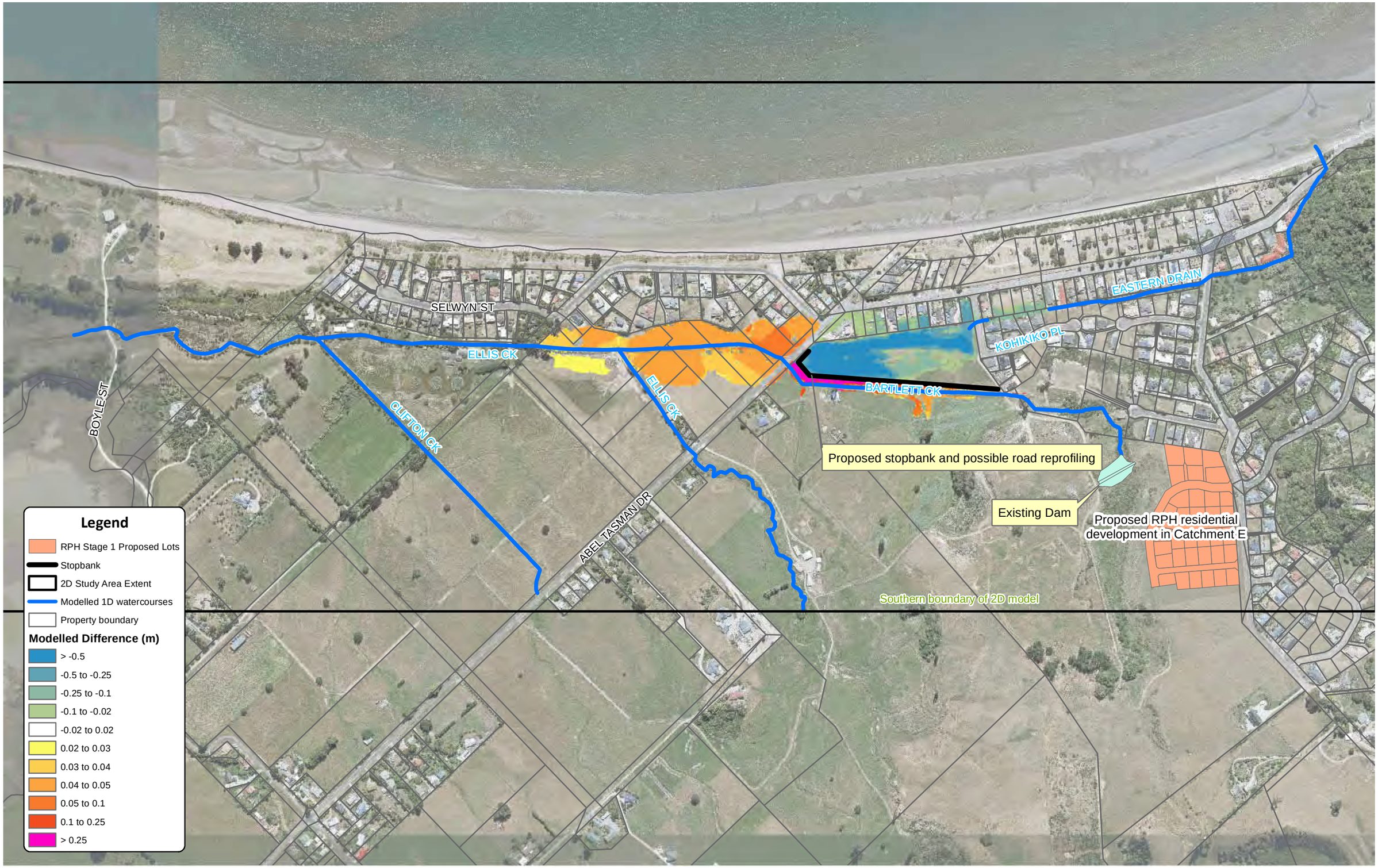
DRAWN	TZHL	Sep.16
CHECKED	DMN	Sept16
APPROVED		Sept 16
ARCFILE	Figure H2.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	

TASMAN DISTRICT COUNCIL
POHARA STORMWATER OPTIONS ASSESSMENT
RPH IMPROVEMENTS
Modelled Difference in Flood Depths for Present Day 1% AEP

FIGURE No. Figure H2 | Rev. 0

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURES\V01\Figure H2.mxd Date: 16/09/2016 Time: 2:30:54 p.m.



Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000
0 60 120 180 240 300 Meters

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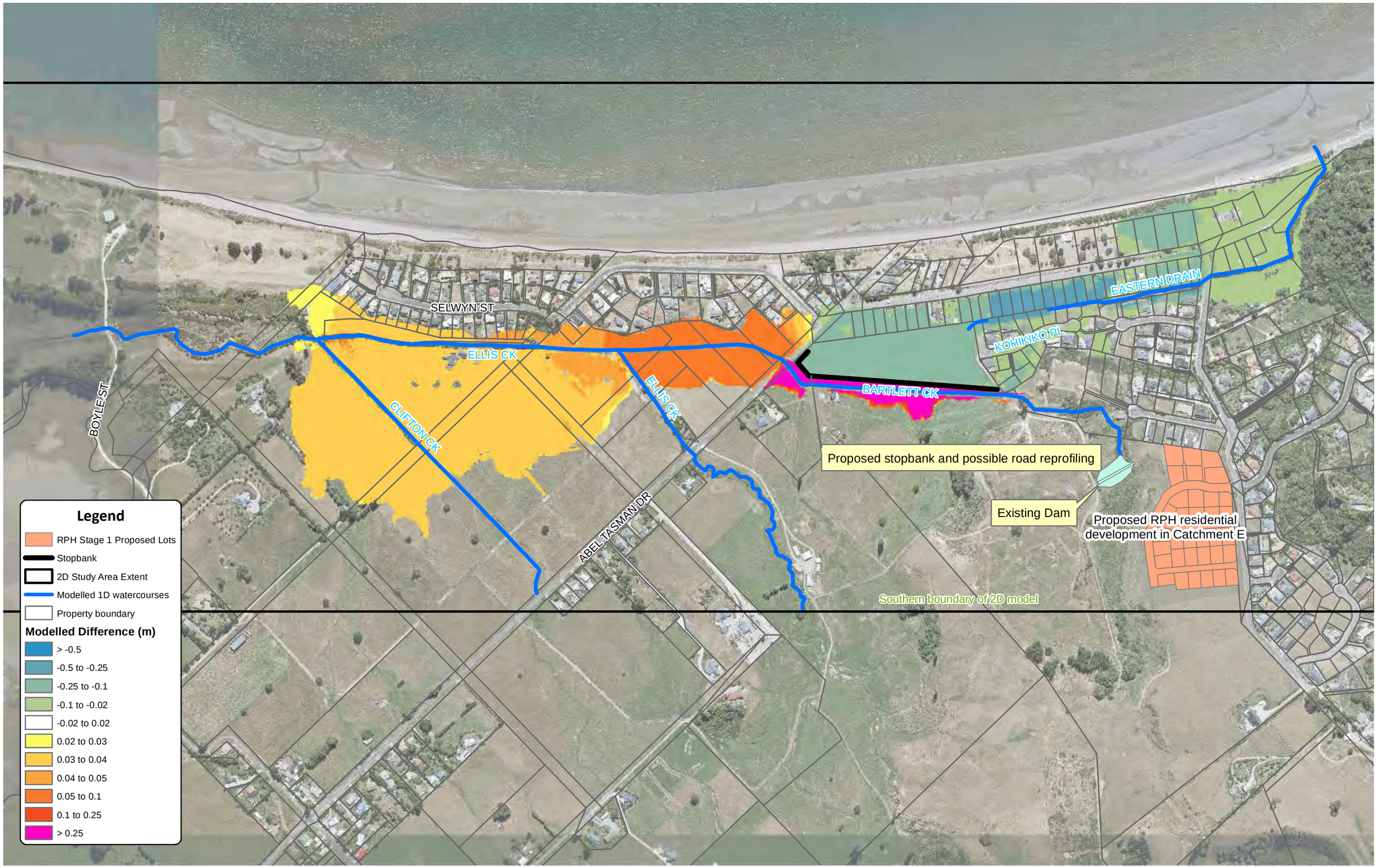
DRAWN	TZHL	Sep.16
CHECKED	DMN	Sept 16
APPROVED		Sept 16
ARCFILE	Figure H3.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	

TASMAN DISTRICT COUNCIL
POHARA STORMWATER OPTIONS ASSESSMENT
RPH IMPROVEMENTS
Modelled Difference in Flood Depths for 2100 10% AEP

FIGURE No. Figure H3 | Rev. 0

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURES\V01\Figure H3.mxd Date: 16/09/2016 Time: 2:30:59 p.m.



Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000

0 60 120 180 240 300 Meters

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DRAWN	TZHL	Sep.16
CHECKED	DMV	Sept16
APPROVED		Sept 16
ARCFILE	Figure H4.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	

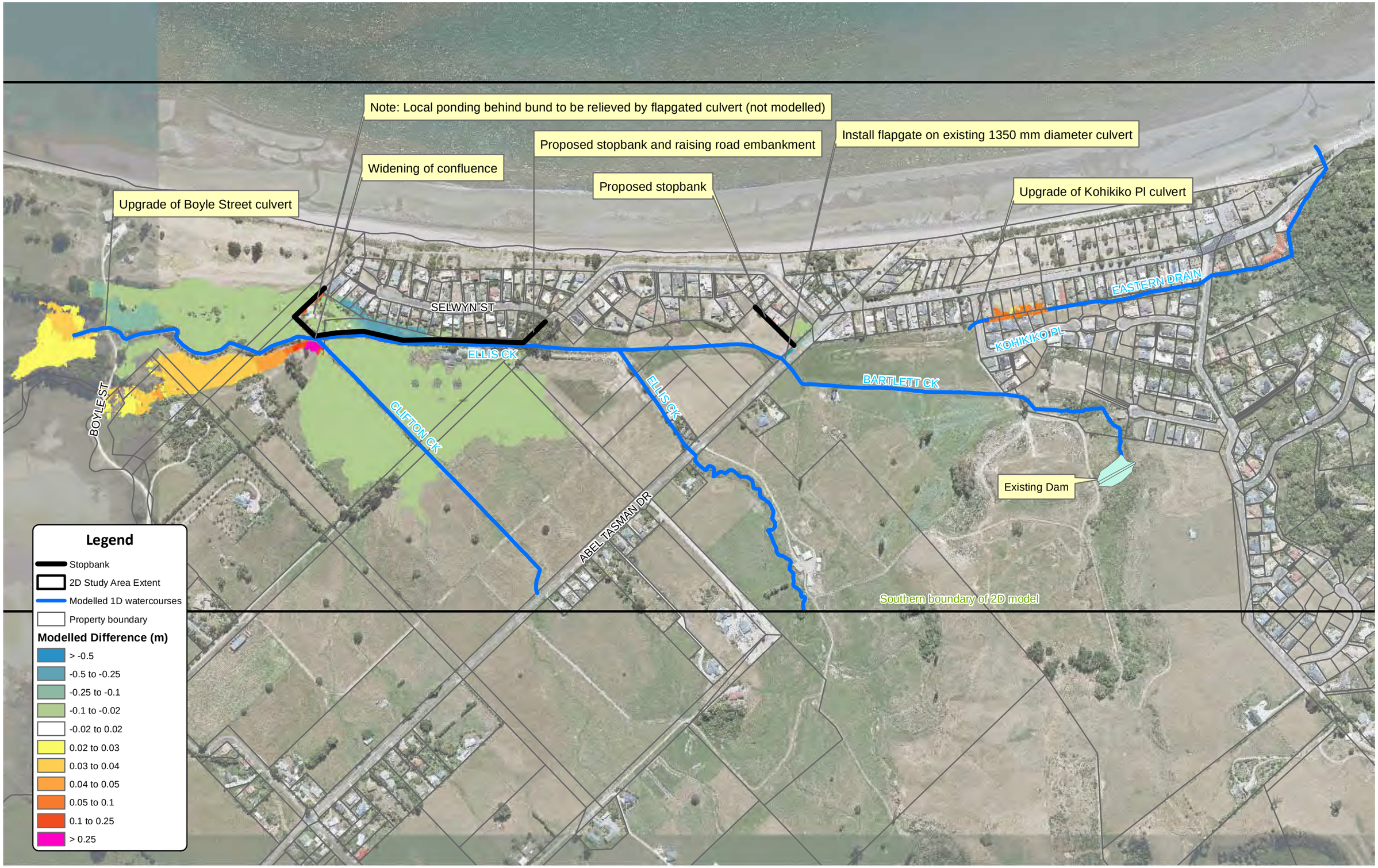
TASMAN DISTRICT COUNCIL
POHARA STORMWATER OPTIONS ASSESSMENT
RPH IMPROVEMENTS
Modelled Difference in Flood Depths for 2100 1% AEP

FIGURE No. Figure H4 Rev. 0

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURES\V01\Figure H4.mxd Date: 16/09/2016 Time: 2:31:04 p.m.

Appendix I: Difference maps – TDC Network Improvement Option Set 1

- Figure I1 – Flood differences – present day 10% AEP
- Figure I2 – Flood differences – present day 1% AEP
- Figure I3 – Flood differences – 2100 10% AEP
- Figure I4 – Flood differences – 2100 1% AEP



Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000
0 60 120 180 240 300 Meters

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DRAWN	TZHL	Sep.16
CHECKED	DMV	Sept16
APPROVED		Sept 16
ARCFILE	Figure I1.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	
FIGURE No.	Figure I1	Rev. 0

TASMAN DISTRICT COUNCIL
POHARA STORMWATER OPTIONS ASSESSMENT
TDC IMPROVEMENTS OPTION SET 1
Modelled Difference in Flood Depths for Present Day 10% AEP

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURES\V01\Figure I1.mxd Date: 16/09/2016 Time: 2:31:08 p.m.

Note: Local ponding behind bund to be relieved by flapgated culvert (not modelled)

Proposed stopbank and raising road embankment

Install flapgate on existing 1350 mm diameter culvert

Widening of confluence

Proposed stopbank

Upgrade of Boyle Street culvert

Upgrade of Kohikiko Pl culvert

SELWYN ST

EASTERN DRAIN

KOHIKIKO PL

ELLIS CK

BARTLETT CK

BOYLE ST

CLIFTON CK

ELLIS CK

ABEL TASMAN DR

Existing Dam

Southern boundary of 2D model

Legend

- Stopbank
- 2D Study Area Extent
- Modelled 1D watercourses
- Property boundary

Modelled Difference (m)

- > -0.5
- -0.5 to -0.25
- -0.25 to -0.1
- -0.1 to -0.02
- -0.02 to 0.02
- 0.02 to 0.03
- 0.03 to 0.04
- 0.04 to 0.05
- 0.05 to 0.1
- 0.1 to 0.25
- > 0.25

Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000

0 60 120 180 240 300 Meters

N

Location Plan

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DRAWN	TZHL	Sep.16
CHECKED	DMN	Sept16
APPROVED		Sept 16
ARCFILE	Figure I2.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	

TASMAN DISTRICT COUNCIL

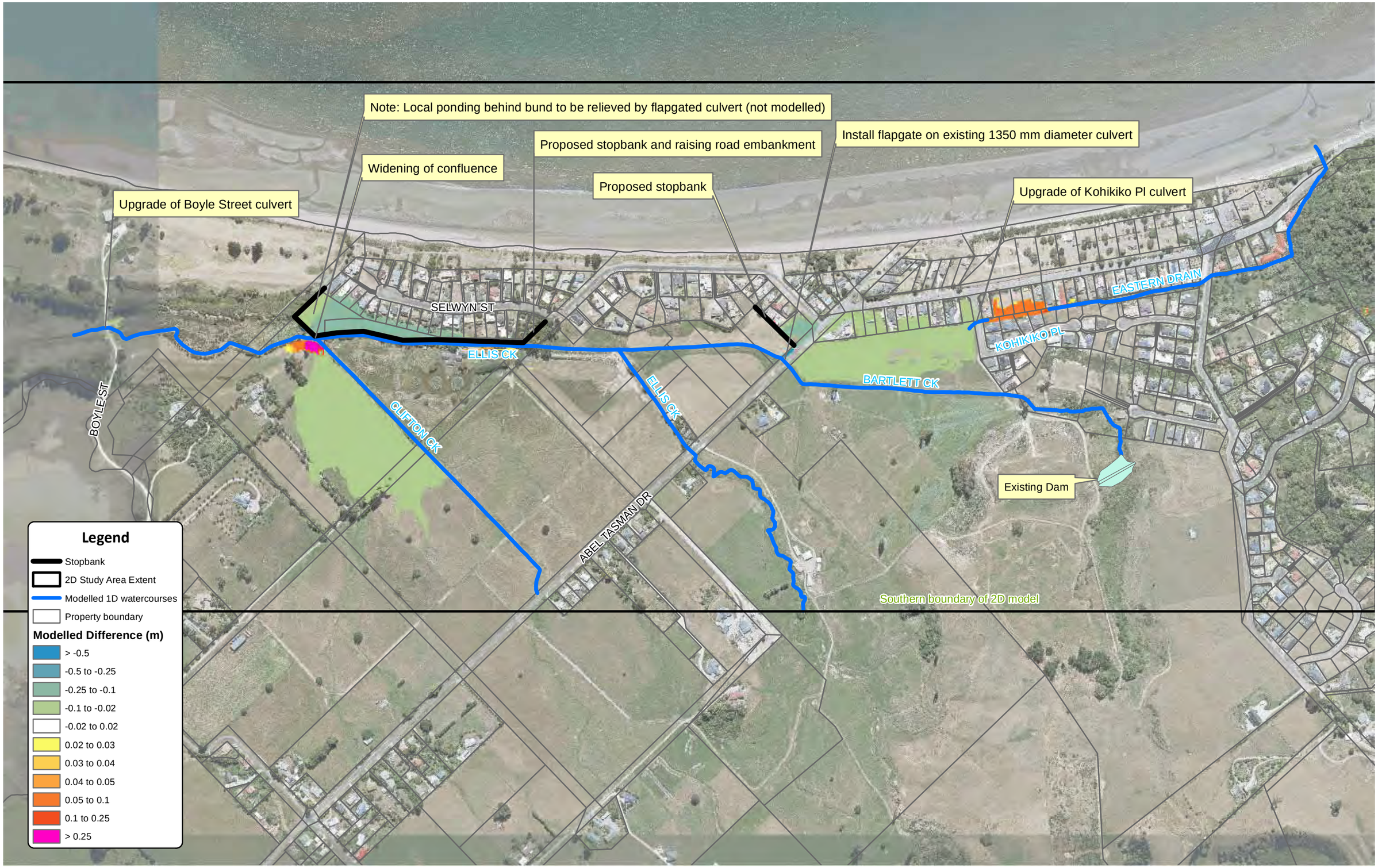
POHARA STORMWATER OPTIONS ASSESSMENT

TDC IMPROVEMENTS OPTION SET 1

Modelled Difference in Flood Depths for Present Day 1% AEP

FIGURE No. Figure I2 | Rev. 0

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURESVO1\Figure I2.mxd Date: 16/09/2016 Time: 2:31:13 p.m.



Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000

0 60 120 180 240 300 Meters

N

Location Plan

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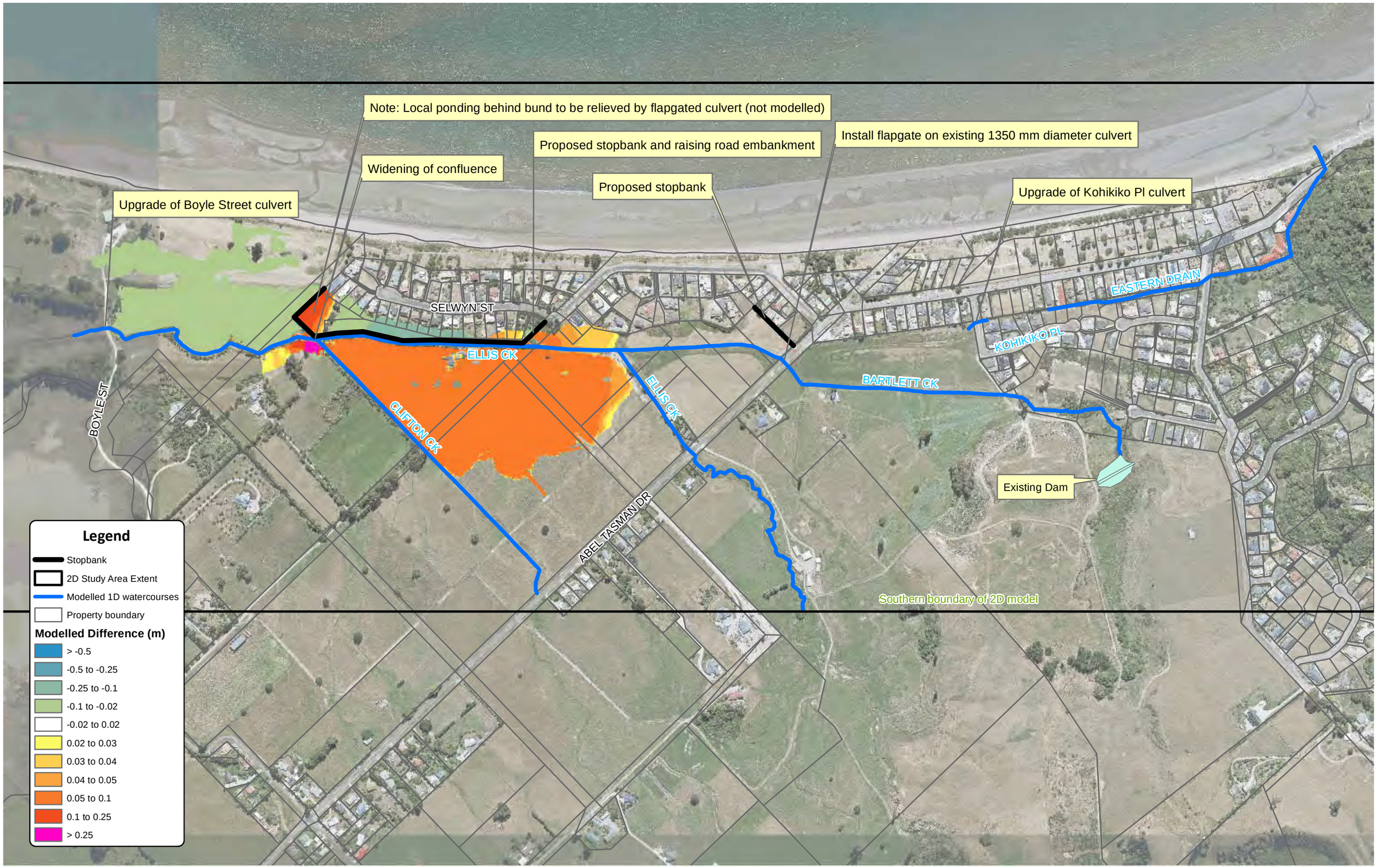
DRAWN	TZHL	Sep.16
CHECKED	DMN	Sept 16
APPROVED		Sept 16
ARCFILE	Figure I3.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	
FIGURE No.	Figure I3	Rev. 0

TASMAN DISTRICT COUNCIL
POHARA STORMWATER OPTIONS ASSESSMENT
TDC IMPROVEMENTS SET 1
Modelled Difference in Flood Depths for 2100 10% AEP

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURES\V01\Figure I3.mxd Date: 16/09/2016 Time: 2:31:18 p.m.



Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000
0 60 120 180 240 300 Meters

Location Plan

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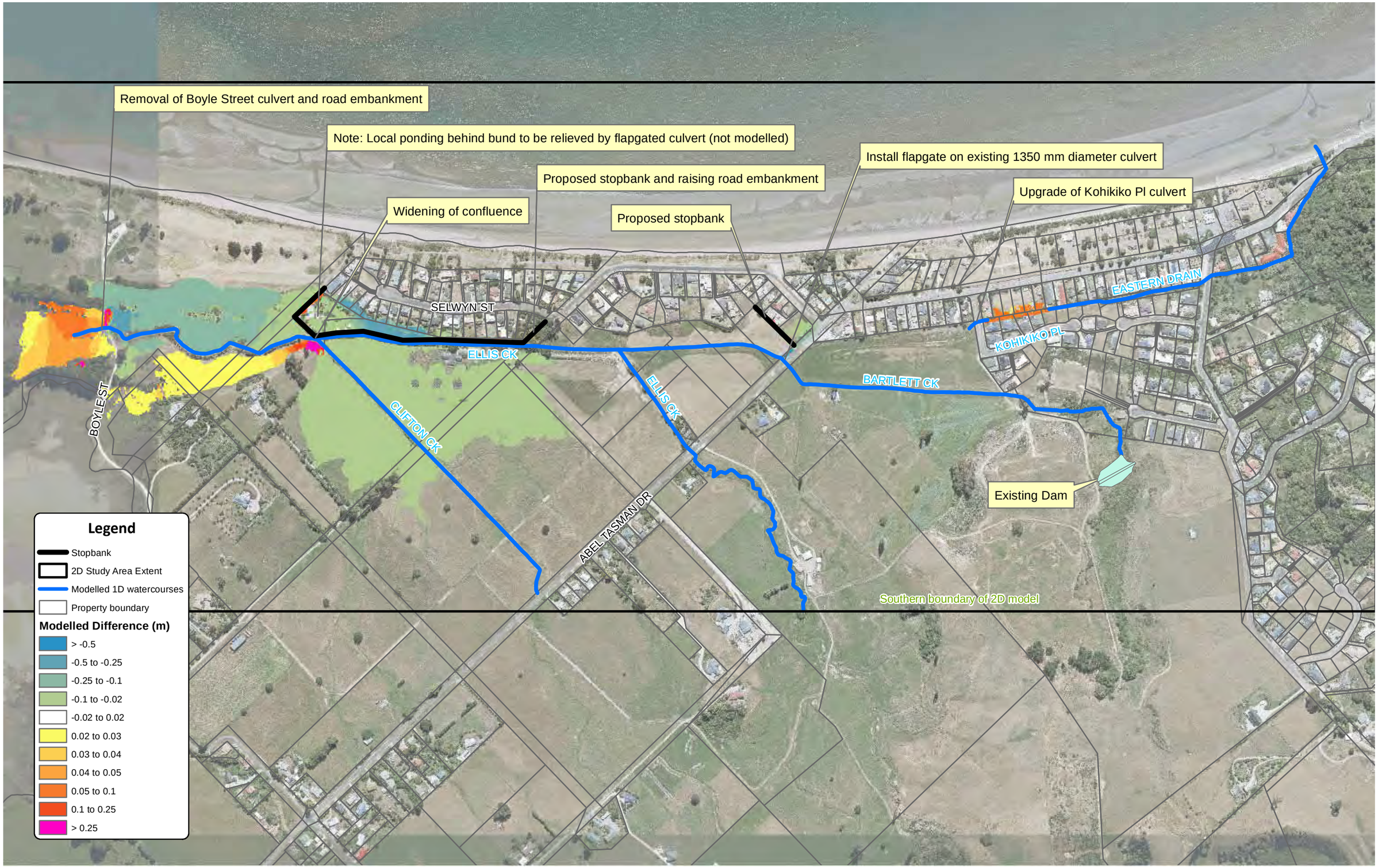
DRAWN	TZHL	Sep.16
CHECKED	DMN	Sept16
APPROVED		Sept 16
ARCFILE	Figure I4.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	
FIGURE No.	Figure I4	Rev. 0

TASMAN DISTRICT COUNCIL
POHARA STORMWATER OPTIONS ASSESSMENT
TDC IMPROVEMENTS OPTION SET 1
Modelled Difference in Flood Depths for 2100 1% AEP

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURES\V01\Figure I4.mxd Date: 16/09/2016 Time: 2:31:23 p.m.

Appendix J: Difference maps – TDC Network Improvement Option Set 2

- Figure J1 – Flood differences – present day 10% AEP
- Figure J2 – Flood differences – present day 1% AEP
- Figure J3 – Flood differences – 2100 10% AEP
- Figure J4 – Flood differences – 2100 1% AEP



Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000
0 60 120 180 240 300 Meters

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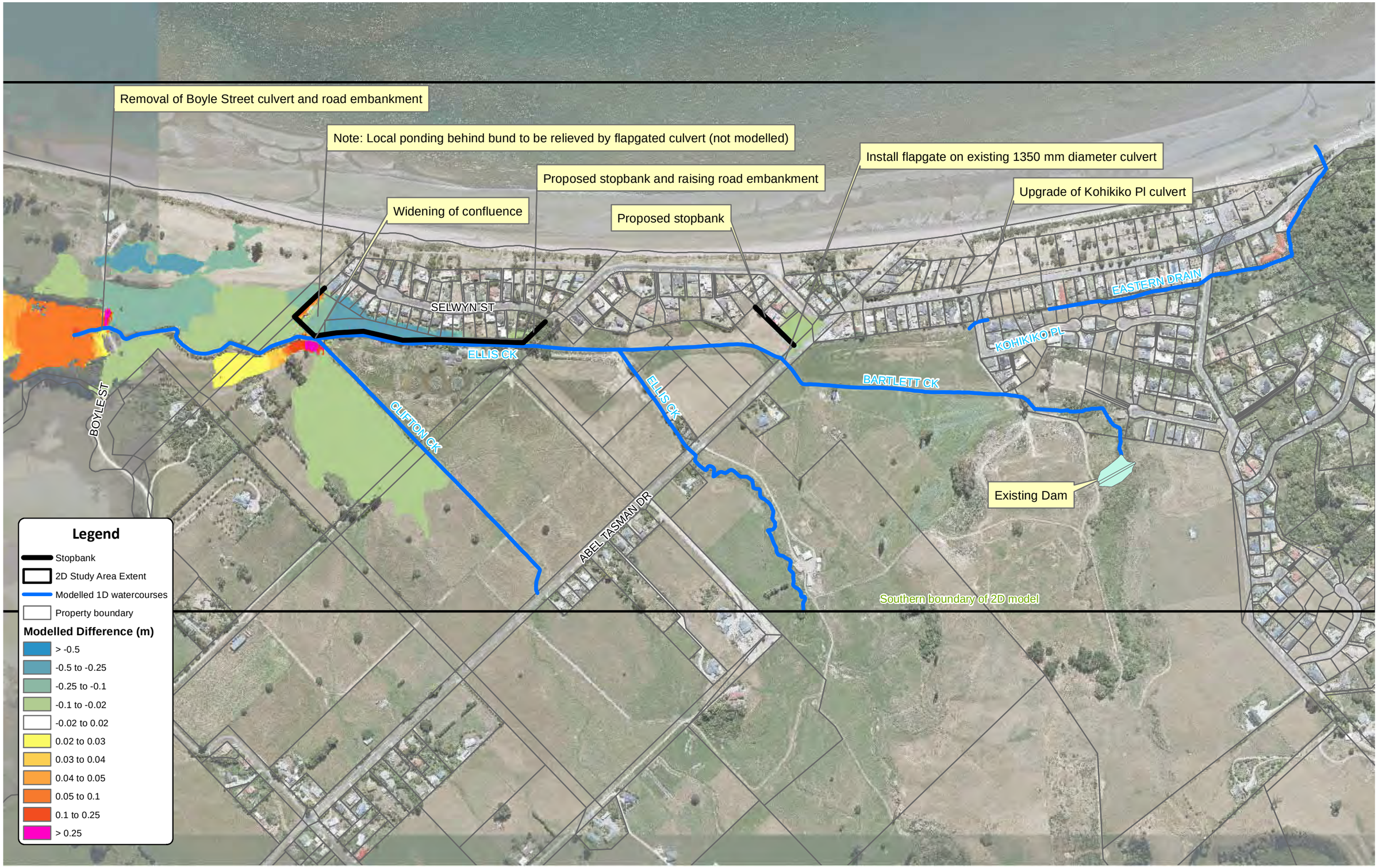
DRAWN	TZHL	Sep.16
CHECKED	DWV	Sept16
APPROVED		Sept 16
ARCFILE	Figure J1.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	

TASMAN DISTRICT COUNCIL
POHARA STORMWATER OPTIONS ASSESSMENT
TDC IMPROVEMENTS OPTION SET 2
Modelled Difference in Flood Depths for Present Day 10% AEP

FIGURE No. Figure J1 | Rev. 0



Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000

0 60 120 180 240 300 Meters

N

Location Plan

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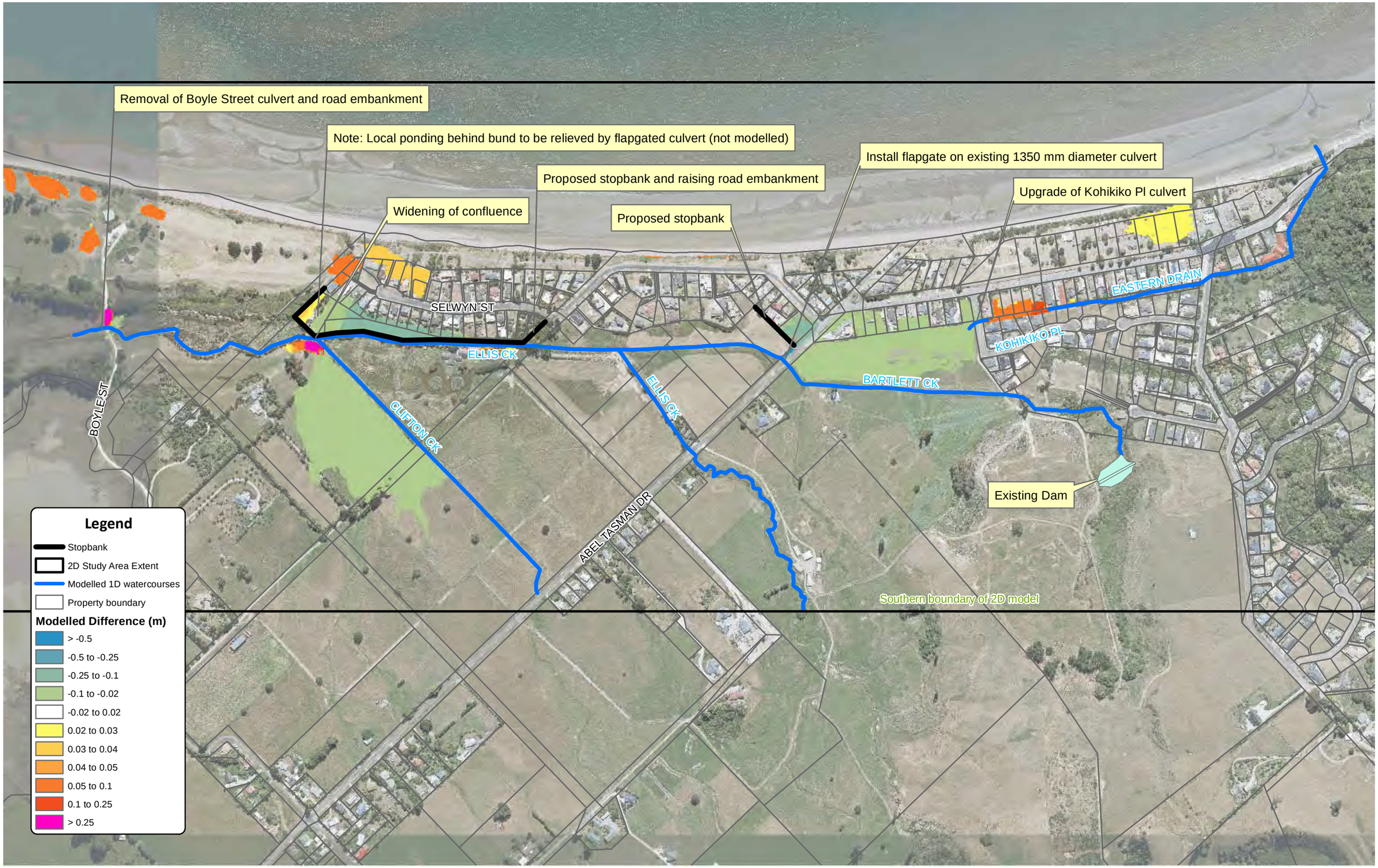
DRAWN	TZHL	Sep.16
CHECKED	DMV	Sept16
APPROVED		Sept 16
ARCFILE	Figure J2.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	

TASMAN DISTRICT COUNCIL
POHARA STORMWATER OPTIONS ASSESSMENT
TDC IMPROVEMENTS OPTION SET 2
Modelled Difference in Flood Depths for Present Day 1% AEP

FIGURE No. Figure J2 Rev. 0

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURESVO1\Figure J2.mxd Date: 16/09/2016 Time: 2:31:32 p.m.



Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000

0 60 120 180 240 300 Meters

N

Location Plan

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DRAWN	TZHL	Sep.16
CHECKED	DWV	Sept16
APPROVED		Sept 16
ARCFILE	Figure J3.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	

TASMAN DISTRICT COUNCIL
POHARA STORMWATER OPTIONS ASSESSMENT
TDC IMPROVEMENTS OPTION SET 2
Modelled Difference in Flood Depths for 2100 10% AEP

FIGURE No. Figure J3 Rev. 0

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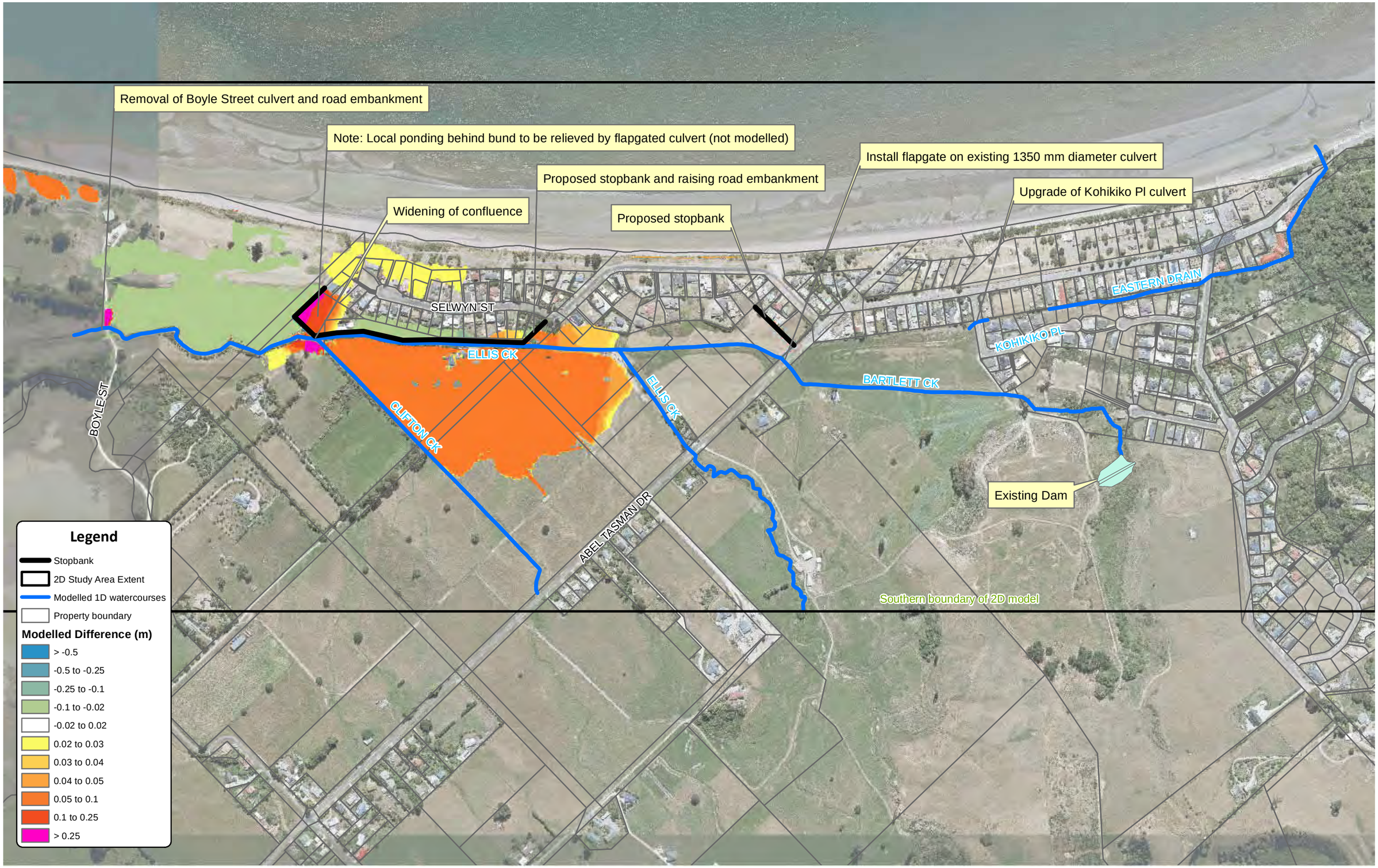

Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000

0 60 120 180 240 300 Meters

N

Location Plan

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DRAWN	TZHL	Sep.16
CHECKED	DMN	Sept16
APPROVED		Sept 16
ARCFILE	Figure J4.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	

TASMAN DISTRICT COUNCIL

POHARA STORMWATER OPTIONS ASSESSMENT
TDC IMPROVEMENTS SET 2

Modelled Difference in Flood Depths for 2100 1% AEP

FIGURE No. Figure J4

Rev. 0

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURES\V01\Figure J4.mxd Date: 16/09/2016 Time: 2:31:41 p.m.

Appendix K: Difference maps – TDC Network Improvement Option Set 3

- Figure K1 – Flood differences – present day 10% AEP
- Figure K2 – Flood differences – present day 1% AEP
- Figure K3 – Flood differences – 2100 10% AEP
- Figure K4 – Flood differences – 2100 1% AEP

Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000

0 60 120 180 240 300 Meters

N

Location Plan

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DRAWN	TZHL	Sep.16
CHECKED	DWV	Sept16
APPROVED		Sept 16
ARCFILE	Figure K1.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	

TASMAN DISTRICT COUNCIL

POHARA STORMWATER OPTIONS ASSESSMENT

TDC IMPROVEMENTS OPTION SET 3

Modelled Difference in Flood Depths for Present Day 10% AEP

FIGURE No. Figure K1 | Rev. 0

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURES\VO1\Figure K1.mxd Date: 16/09/2016 Time: 2:31:46 p.m.

Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000
0 60 120 180 240 300 Meters

N

Location Plan

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DRAWN	TZHL	Sep.16
CHECKED	DMN	Sept16
APPROVED		Sept 16
ARCFILE	Figure K2.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	

TASMAN DISTRICT COUNCIL
POHARA STORMWATER OPTIONS ASSESSMENT
TDC IMPROVEMENTS OPTION SET 3
Modelled Difference in Flood Depths for Present Day 1% AEP

FIGURE No. Figure K2 | Rev. 0

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURES\V01\Figure K2.mxd Date: 16/09/2016 Time: 2:31:51 p.m.

Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000

0 60 120 180 240 300 Meters

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DRAWN	TZHL	Sep.16
CHECKED	DMV	Sept16
APPROVED		Sept 16
ARCFILE	Figure K3.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	

TASMAN DISTRICT COUNCIL

POHARA STORMWATER OPTIONS ASSESSMENT

TDC IMPROVEMENTS OPTION SET 3

Modelled Difference in Flood Depths for 2100 10% AEP

FIGURE No. Figure K3 | Rev. 0

Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000

0 60 120 180 240 300 Meters

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DRAWN	TZHL	Sep.16
CHECKED	DMV	Sept16
APPROVED		Sept 16
ARCFILE	Figure K4.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	
FIGURE No.	Figure K4	Rev. 0

TASMAN DISTRICT COUNCIL

POHARA STORMWATER OPTIONS ASSESSMENT

TDC IMPROVEMENTS OPTION SET 3

Modelled Difference in Flood Depths for 2100 1% AEP

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURES\V01\Figure K4.mxd Date: 16/09/2016 Time: 3:04:10 p.m.

Appendix L: Difference maps – TDC Network Improvement Option Set 4

- Figure L1 – Flood differences – present day 10% AEP
- Figure L2 – Flood differences – present day 1% AEP
- Figure L3 – Flood differences – 2100 10% AEP
- Figure L4 – Flood differences – 2100 1% AEP

Upgrade twin culvert to 4mx2m box culvert

Note: Local ponding behind bund to be relieved by flapgated culvert (not modelled)

Widening of confluence

Proposed stopbank

Install flapgate on existing 1350 diameter culvert

Upgrade to 750mm diameter culvert

SELWYN ST

ELLIS CK

BOYLE ST

CLIFTON CK

ELLIS CK

BARTLETT CK

KOHIKIKO PL

EASTERN DRAIN

Proposed stopbank and possible road reprofiling

Existing Dam

ABEL TASMAN DR

Proposed RPH residential development in catchment E

Southern boundary of 2D model

Legend

- RPH Stage 1 Proposed Lots
- Proposed stopbank
- 2D Study Area Extent
- Modelled 1D watercourses
- Property boundary

Modelled Difference (m)

- > -0.5
- -0.5 to -0.25
- -0.25 to -0.1
- -0.1 to -0.02
- -0.02 to 0.02
- 0.02 to 0.03
- 0.03 to 0.04
- 0.04 to 0.05
- 0.05 to 0.1
- 0.1 to 0.25
- > 0.25

Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000

0 60 120 180 240 300 Meters

N

Location Plan

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DRAWN	TZHL	Sep.16
CHECKED	DMV	Sept16
APPROVED		Sept 16
ARCFILE	Figure L1.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	
FIGURE No.	Figure L1	Rev. 0

TASMAN DISTRICT COUNCIL

POHARA STORMWATER OPTIONS ASSESSMENT

TDC IMPROVEMENTS OPTION SET 4

Modelled Difference in Flood Depths for Present Day 10% AEP

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURES\V01\Figure L1.mxd Date: 16/09/2016 Time: 2:32:06 p.m.

Upgrade twin culvert to 4mx2m box culvert

Note: Local ponding behind bund to be relieved by flapgated culvert (not modelled)

Widening of confluence

Proposed stopbank

Install flapgate on existing 1350 diameter culvert

Upgrade to 750mm diameter culvert

SELWYN ST

ELLIS CK

BOYLE ST

CLIFTON CK

ELLIS CK

BARTLETT CK

EASTERN DRAIN

KOHIKIKO PL

Proposed stopbank and possible road reprofiling

Existing Dam

ABEL TASMAN DR

Proposed RPH residential development in catchment E

Southern boundary of 2D model

Legend

- RPH Stage 1 Proposed Lots
- Proposed stopbank
- 2D Study Area Extent
- Modelled 1D watercourses
- Property boundary

Modelled Difference (m)

- > -0.5
- -0.5 to -0.25
- -0.25 to -0.1
- -0.1 to -0.02
- -0.02 to 0.02
- 0.02 to 0.03
- 0.03 to 0.04
- 0.04 to 0.05
- 0.05 to 0.1
- 0.1 to 0.25
- > 0.25

Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000

0 60 120 180 240 300 Meters

N

Location Plan

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DRAWN	TZHL	Sep.16
CHECKED	DMV	Sept 16
APPROVED		Sept 16
ARCFILE	Figure L2.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	

TASMAN DISTRICT COUNCIL

POHARA STORMWATER OPTIONS ASSESSMENT

TDC IMPROVEMENTS OPTION SET 4

Modelled Difference in Flood Depths for Present Day 1% AEP

FIGURE No. Figure L2 | Rev. 0

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURES\VO1\Figure L2.mxd Date: 16/09/2016 Time: 2:32:10 p.m.

Upgrade twin culvert to 4mx2m box culvert

Note: Local ponding behind bund to be relieved by flapgated culvert (not modelled)

Widening of confluence

Proposed stopbank

Install flapgate on existing 1350 diameter culvert

Upgrade to 750mm diameter culvert

SELWYN ST

EASTERN DRAIN

KOHIKIKO PL

ELLIS CK

BOYLE ST

CLIFTON CK

ELLIS CK

BARTLETT CK

Proposed stopbank and possible road reprofiling

Existing Dam

ABEL TASMAN DR

Proposed RPH residential development in catchment E

Southern boundary of 2D model

Legend

- RPH Stage 1 Proposed Lots
- Proposed stopbank
- 2D Study Area Extent
- Modelled 1D watercourses
- Property boundary

Modelled Difference (m)

- > -0.5
- -0.5 to -0.25
- -0.25 to -0.1
- -0.1 to -0.02
- -0.02 to 0.02
- 0.02 to 0.03
- 0.03 to 0.04
- 0.04 to 0.05
- 0.05 to 0.1
- 0.1 to 0.25
- > 0.25

Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000

0 60 120 180 240 300 Meters

N

Location Plan

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DRAWN	TZHL	Sep.16
CHECKED	DNV	Sept 16
APPROVED		Sept 16
ARCFILE	Figure L3.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	
FIGURE No.	Figure L3	Rev. 0

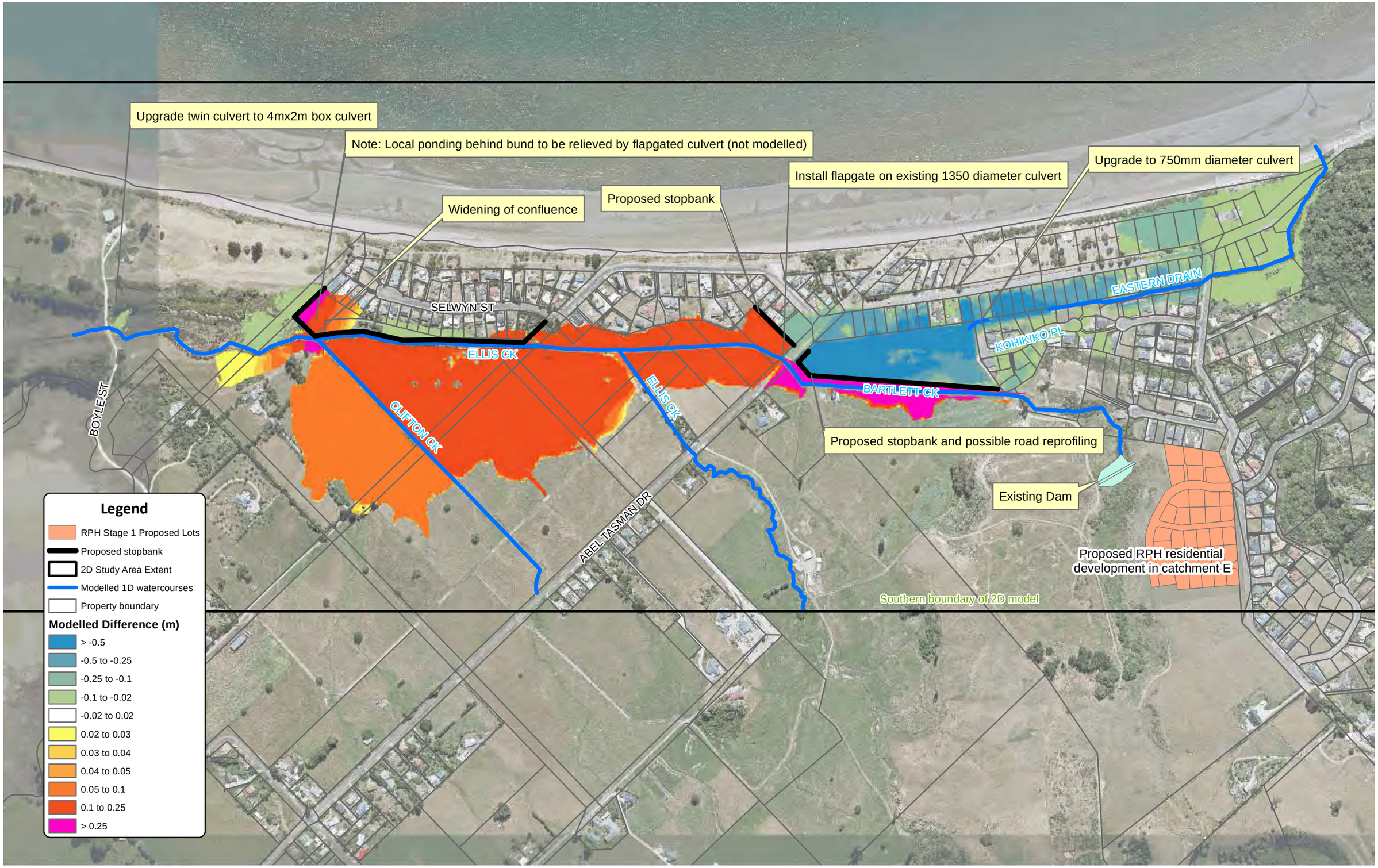
TASMAN DISTRICT COUNCIL

POHARA STORMWATER OPTIONS ASSESSMENT

TDC IMPROVEMENTS OPTION SET 4

Modelled Difference in Flood Depths for 2100 10% AEP

Path: P:\871018\871018.1000\WorkingMaterial\GIS\FIGURES\V01\Figure L3.mxd Date: 16/09/2016 Time: 2:37:35 p.m.



Notes: 1. Aerial photo dated 2015 supplied by Tasman District Council.
2. Modelling based on 2011 LiDAR data supplied by Tasman District Council.

A3 SCALE 1:6,000
0 60 120 180 240 300 Meters

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51 Halifax Street, Nelson
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DRAWN	TZHL	Sep.16
CHECKED	DMV	Sept16
APPROVED		Sept 16
ARCFILE	Figure L4.mxd	
SCALE (AT A3 SIZE)	1:6,000	
PROJECT No.	871018.1000	

TASMAN DISTRICT COUNCIL
POHARA STORMWATER OPTIONS ASSESSMENT
TDC IMPROVEMENTS OPTION SET 4
Modelled Difference in Flood Depths for 2100 1% AEP

FIGURE No. Figure L4 | Rev. 0

Appendix M: Effect of improvement options on flooded floors

Modelled flood levels relative to surveyed floor levels, where floor levels are known

Existing flooded floor

Flooded floor alleviated by mitigation option

Street Adress	Type	Floor Level (m)	Present day 10% AEP flood level (RL m)						Present day 1% AEP flood level (RL m)						Year 2100 10% AEP flood level (RL m)						Year 2100 day 1% AEP flood level (RL m)					
			Existing	RPH Improvements	TDC Improvement Option Set 1	TDC Improvement Option Set 2	TDC Improvement Option Set 3	TDC Improvement Option Set 4	Existing	RPH Improvements	TDC Improvement Option Set 1	TDC Improvement Option Set 2	TDC Improvement Option Set 3	TDC Improvement Option Set 4	Existing	RPH Improvements	TDC Improvement Option Set 1	TDC Improvement Option Set 2	TDC Improvement Option Set 3	TDC Improvement Option Set 4	Existing	RPH Improvements	TDC Improvement Option Set 1	TDC Improvement Option Set 2	TDC Improvement Option Set 3	TDC Improvement Option Set 4
53 Selwyn St	House	3.80	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49
59 Selwyn St	House	3.99	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78
59a Selwyn St	House	4.09	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
59b Selwyn St	House	4.17	3.23	3.26	3.16	3.16	3.22	3.16	3.55	3.59	3.27	3.27	3.55	3.34	3.42	3.42	3.25	3.33	3.41	3.25	3.67	3.70	3.64	3.64	3.66	3.74
59b Selwyn St	Shed	3.34	3.24	3.28	3.17	3.17	3.23	3.17	3.59	3.62	3.27	3.27	3.58	3.34	3.44	3.44	3.25	3.33	3.44	3.25	3.70	3.73	3.64	3.64	3.70	3.74
59c Selwyn St	House	3.30	3.00	3.01	3.02	3.02	3.00	3.02	3.18	3.22	3.27	3.27	3.15	3.34	3.30	3.30	3.25	3.33	3.29	3.25	3.41	3.42	3.64	3.64	3.39	3.74
59c Selwyn St	Garage	2.83	3.20	3.23	3.16	3.16	3.19	3.16	3.43	3.46	3.27	3.27	3.43	3.34	3.35	3.35	3.25	3.33	3.34	3.25	3.52	3.54	3.64	3.64	3.51	3.74
63 Selwyn St	House	4.73	3.74	3.74	3.74	3.74	3.74	3.74	3.76	3.81	3.74	3.74	3.76	3.83	3.74	3.74	3.74	3.74	3.74	3.74	3.90	3.94	3.93	3.93	3.89	4.02
63 Selwyn St	Garage	3.90	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82
65a Selwyn St	House	3.98	3.66	3.66	3.66	3.66	3.66	3.66	3.74	3.79	3.73	3.72	3.73	3.82	3.66	3.66	3.66	3.66	3.66	3.66	3.87	3.92	3.92	3.92	3.87	4.01
67 Selwyn St	House	5.78	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.11	5.11	5.11	5.11	5.11	5.11
69 Selwyn St	Garage	4.37	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.10	4.10	4.10	4.10	4.10	4.10
85 Selwyn St	House	4.80	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49
85 Selwyn St	Garage	4.03	3.25	3.30	3.17	3.17	3.24	3.17	3.64	3.68	3.27	3.27	3.63	3.34	3.47	3.48	3.25	3.33	3.47	3.25	3.76	3.80	3.64	3.64	3.76	3.74
94 Selwyn St	Garage	2.79	2.87	2.87	2.87	2.87	2.87	2.87	3.28	3.28	3.28	3.28	3.28	3.28	3.30	3.30	3.30	3.38	3.38	3.30	3.86	3.86	3.86	3.86	3.89	3.86
95 Selwyn St	House	3.12	3.24	3.28	3.11	3.11	3.23	3.11	3.53	3.57	3.27	3.27	3.53	3.34	3.42	3.41	3.25	3.33	3.41	3.25	3.64	3.67	3.64	3.64	3.64	3.74
97 Selwyn St	House	3.37	2.98	2.98	2.98	2.98	2.98	2.98	3.28	3.28	3.28	3.28	3.28	3.28	3.30	3.30	3.30	3.33	3.31	3.30	3.47	3.50	3.64	3.64	3.46	3.74
734 Abel Tasman Dr	House	4.24	4.02	4.02	4.02	4.02	4.02	4.02	4.25	4.02	4.24	4.24	4.25	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.36	4.13	4.36	4.36	4.36	4.02
742 Abel Tasman Dr	House	3.98	3.85	3.85	3.85	3.85	3.85	3.85	4.25	3.97	4.24	4.24	4.25	3.89	3.92	3.85	3.87	3.88	3.93	3.85	4.36	4.13	4.36	4.36	4.36	3.90
744 Abel Tasman Dr	House	4.48	3.86	3.86	3.86	3.86	3.86	3.86	4.25	3.98	4.24	4.24	4.25	3.90	3.92	3.88	3.88	3.89	3.93	3.88	4.36	4.13	4.36	4.36	4.36	3.91
744 Abel Tasman Dr	Garage	3.89	3.79	3.79	3.79	3.79	3.79	3.79	4.25	3.94	4.24	4.24	4.25	3.83	3.92	3.80	3.87	3.88	3.93	3.80	4.36	4.13	4.36	4.36	4.36	3.83
746 Abel Tasman Dr	House	4.28	3.81	3.81	3.81	3.81	3.81	3.81	4.25	3.96	4.24	4.24	4.25	3.87	3.92	3.82	3.87	3.88	3.93	3.82	4.36	4.13	4.36	4.36	4.36	3.88
748 Abel Tasman Dr	House	4.26	4.16	4.16	4.16	4.16	4.16	4.16	4.25	4.16	4.24	4.24	4.25	4.16	4.16	4.16	4.16	4.16	4.16	4.16	4.36	4.17	4.35	4.35	4.36	4.17
748 Abel Tasman Dr	Garage	4.16	4.04	4.04	4.04	4.04	4.04	4.04	4.25	4.04	4.24	4.24	4.25	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.36	4.13	4.35	4.35	4.36	4.04
750 Abel Tasman Dr	House	4.12	4.04	4.04	4.04	4.04	4.04	4.04	4.25	4.04	4.24	4.24	4.25	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.36	4.13	4.35	4.35	4.36	4.04
750 Abel Tasman Dr	House	4.09	3.65	3.54	3.64	3.64	3.65	3.54	4.25	3.94	4.24	4.24	4.25	3.60	3.92	3.55	3.87	3.87	3.93	3.55	4.36	4.13	4.35	4.35	4.36	3.70
754 Abel Tasman Dr	House	4.00	3.78	3.78	3.78	3.78	3.78	3.78	4.25	3.94	4.24	4.24	4.25	3.78	3.92	3.78	3.87	3.87	3.93	3.78	4.36	4.13	4.35	4.35	4.36	3.78
754 Abel Tasman Dr	Garage	3.90	3.71	3.71	3.71	3.71	3.71	3.71	4.25	3.94	4.24	4.24	4.25	3.71	3.92	3.71	3.87	3.87	3.93	3.71	4.36	4.13	4.35	4.35	4.36	3.71
756 Abel Tasman Dr	House	4.69	3.99	3.99	3.99	3.99	3.99	3.99	4.25	4.00	4.24	4.24	4.25	4.00	3.99	3.99	3.99	3.99	3.99	3.99	4.36	4.13	4.35	4.35	4.36	4.00
756 Abel Tasman Dr	Shed	3.55	3.65	3.52	3.64	3.64	3.65	3.52	4.25	3.94	4.24	4.24	4.25	3.60	3.92	3.53	3.87	3.87	3.93	3.53	4.36	4.13	4.35	4.35	4.36	3.70
756 Abel Tasman Dr	Shed	3.86	3.65	3.52	3.64	3.64	3.65	3.52	4.25	3.94	4.24	4.24	4.25	3.60	3.92	3.53	3.87	3.87	3.93	3.53	4.36	4.13	4.35	4.35	4.36	3.70
758 Abel Tasman Dr	House	4.63	4.34	4.34	4.34	4.34	4.34	4.34	4.35	4.35	4.35	4.35	4.35	4.35	4.34	4.34	4.34	4.34	4.34	4.34	4.35	4.35	4.35	4.35	4.35	4.35
758 Abel Tasman Dr	Garage	4.45	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37
760 Abel Tasman Dr	House	4.80	4.26	4.26	4.26	4.26	4.26	4.26	4.29	4.29	4.29	4.29	4.29	4.29	4.26	4.27	4.27	4.27	4.27	4.27	4.34	4.29	4.34	4.34	4.34	4.29
760 Abel Tasman Dr	House	4.80	4.26	4.26	4.26	4.26	4.26	4.26	4.27	4.27	4.27	4.27	4.27	4.27	4.26	4.26	4.26	4.26	4.26	4.26	4.34	4.28	4.34	4.34	4.34	4.28
760 Abel Tasman Dr	Garage	4.47	4.23	4.23	4.23	4.23	4.23	4.23	4.25	4.23	4.24	4.24	4.25	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.34	4.23	4.34	4.34	4.34	4.23
762 Abel Tasman Dr	House	4.38	3.48	3.47	3.48	3.48	3.48	3.47	4.24	3.93	4.23	4.23	4.24	3.67	3.92	3.59	3.87	3.87	3.93	3.59	4.34	4.12	4.34	4.34	4.34	3.69
762 Abel Tasman Dr	Garage	3.63	3.48	3.47	3.48	3.48	3.48	3.47	4.24	3.93	4.23	4.23	4.24	3.67	3.92	3.59	3.87	3.87	3.93	3.59	4.34	4.12	4.34	4.34	4.34	3.69

Appendix N: Preliminary cost schedules for network improvement options

Pohara Drainage Network Improvement Options

Preliminary Cost Estimate - RPH works (Bartlett Creek bund)

Tonkin+Taylor

Rev:	2
Date	15/11/2016
By	TZHL
Checked	DNV

	Summary		
1.0	**PRELIMINARY & GENERAL**	$14,000	
2.0	**BARTLETT CREEK BUND**	$68,000	
	CONSTRUCTION SUB TOTAL	$82,000	
	CONTINGENCY	$25,000	30%
	CONSTRUCTION TOTAL	**$107,000**	Excl GST

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT
1.0	**PRELIMINARY & GENERAL**				
	All-in allowance to include for consenting, mobilising to site, stream diversion and ESCP and other consent compliance tasks		20%		$13,460.00
		Sub-total carried to summary			$13,460.00
2.0	**Bartlett Creek Bund (380m long, typical height 1m)**				
2.1	*Strip topsoil and organics and undercut to competent material, stockpile selected soil for topsoiling/landscaping*	532	m³	$15.00	$7,980.00
2.2	*Supply and place/compact approved stopbank fill material as per specification*	1,520	m³	$25.00	$38,000.00
2.3	*Reinstate surface with topsoil and grass*	220	m³	$6.00	$1,320.00
2.4	*Local reprofiling of SH60 to control direction of overflows*	1	LS	$20,000.00	$20,000.00
		Sub-total carried to summary			$67,300.00

Pohara Drainage Network Improvement Options

Preliminary Cost Estimate - TDC Option Set 1

Tonkin+Taylor

Rev:	2
Date	15/11/2016
By	TZHL
Checked	DNV

	Summary		
1.0	**PRELIMINARY & GENERAL**	$16,000	
2.0	**TDC OPTION SET 1**	$80,000	
	CONSTRUCTION SUB TOTAL	$96,000	
	CONTINGENCY	$29,000	30%
	CONSTRUCTION TOTAL	**$125,000**	Excl GST

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT
1.0	**PRELIMINARY & GENERAL**				
	All-in allowance to include for consenting, mobilising to site, stream diversion and ESCP and other consent compliance tasks		20%		$15,868.40
		Sub-total carried to summary			$15,868.40
2.0	**TDC OPTION SET 1**				
2.1	Widening of confluence (cut to waste, assuming 0.4m deep typical and 800 m² total disturbed ground)	320	m³	$40.00	$12,800.00
2.2	Selywn St Bund (western end of Selwyn St - 1.5m high typical, 110m long)				
2.2.1	*Strip topsoil and organics and undercut to competent material, stockpile selected soil for topsoiling/landscaping*	220	m³	$15.00	$3,300.00
2.2.2	*Supply and place/compact approved stopbank fill material as per specification*	660	m³	$25.00	$16,500.00
2.2.3	*Reinstate surface with topsoil and grass*	220	m³	$6.00	$1,320.00
2.3	Selywn St bund (eastern end of Selwyn St - 50m long, 1.2m high typical)				
2.3.1	*Strip topsoil and organics and undercut to competent material, stockpile selected soil for topsoiling/landscaping*	82	m³	$15.00	$1,230.00
2.3.2	*Supply and place/compact approved stopbank fill material as per specification*	240	m³	$25.00	$6,000.00
2.3.3	*Reinstate surface with topsoil and grass*	82	m³	$6.00	$492.00
2.4	Remove twin culvert off site	1	LS	$1,200.00	$1,200.00
2.5	Install new box culvert at Boyle Street				
2.5.1	*Supply and place new box culvert (2m x 4m), including foundation preparation*	7	m	$3,500.00	$24,500.00
2.5.2	*Supply and place riprap over geotextile (or similar) protection to inlet and outlet banks/beds*	1	LS	$1,500.00	$1,500.00
2.6	Upgrade Kohikiko culvert to 750mm dia	5	m	$900.00	$4,500.00
2.7	Supply and place Abel Tasman Drive culvert flapgate	1	LS	$6,000.00	$6,000.00
		Sub-total carried to summary			$79,342.00

Pohara Drainage Network Improvement Options

Preliminary Cost Estimate - TDC Option Set 2

Tonkin+Taylor

Rev:	2
Date	15/11/2016
By	TZHL
Checked	DNV

	Summary		
1.0	**PRELIMINARY & GENERAL**	$16,000	
2.0	**TDC OPTION SET 2**	$152,000	
	CONSTRUCTION SUB TOTAL	$168,000	
	CONTINGENCY	$51,000	30%
	CONSTRUCTION TOTAL	**$219,000**	Excl GST

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT
1.0	**PRELIMINARY & GENERAL**				
	All-in allowance to include for consenting, mobilising to site, stream diversion and ESCP and other consent compliance tasks		10%		$15,188.40
		Sub-total carried to summary			$15,188.40
2.0	**TDC OPTION SET 2**				
2.1	Widening of confluence (cut to waste, assuming 0.4m deep typical and 800 m² total disturbed ground)	320	m³	$40.00	$12,800.00
2.2	Selywn St Bund (western end of Selwyn St - 1.5m high typical, 110m long)				
2.2.1	*Strip topsoil and organics and undercut to competent material, stockpile selected soil for topsoiling/landscaping*	220	m³	$15.00	$3,300.00
2.2.2	*Supply and place/compact approved stopbank fill material as per specification*	660	m³	$25.00	$16,500.00
2.2.3	*Reinstate surface with topsoil and grass*	220	m³	$6.00	$1,320.00
2.3	Selywn St bund (eastern end of Selwyn St - 50m long, 1.2m high typical)				
2.3.1	*Strip topsoil and organics and undercut to competent material, stockpile selected soil for topsoiling/landscaping*	82	m³	$15.00	$1,230.00
2.3.2	*Supply and place/compact approved stopbank fill material as per specification*	240	m³	$25.00	$6,000.00
2.3.3	*Reinstate surface with topsoil and grass*	82	m³	$6.00	$492.00
2.4	Remove twin culvert off site	1	LS	$1,200.00	$1,200.00
2.5	Removal of Boyle Street embankment				
2.5.1	*Cut embankment to waste (average 0.4 m deep over 380m length - may be able to use material for new access road to reduce costs)*	152	m³	$30.00	$4,560.00
2.5.2	*Reinstate surface with topsoil and grass*	304	m²	$6.00	$1,824.00
2.6	Construct new access road to clubhouse (assume 6m width, 150mm layer of AP65, 150mm layer of AP40)	900	m	$150.00	$135,000
2.7	Upgrade of Kohikiko culvert	5	m	$900.00	$4,500.00
2.8	Supply and place Abel Tasman Drive culvert flapgate	1	LS	$6,000.00	$6,000.00
		Sub-total carried to summary			$151,884.00

Pohara Drainage Network Improvement Options

Preliminary Cost Estimate - TDC Option Set 3

Tonkin+Taylor

Rev:	2
Date	15/11/2016
By	TZHL
Checked	DNV

	Summary			
1.0	**PRELIMINARY & GENERAL**	$15,000		
2.0	**TDC OPTION SET 3**	$143,000		
	CONSTRUCTION SUB TOTAL	$158,000		
	CONTINGENCY	$48,000	30%	
	CONSTRUCTION TOTAL	**$206,000**	Excl GST	

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT
1.0	**PRELIMINARY & GENERAL**				
	All-in allowance to include for consenting, mobilising to site, stream diversion and ESCP and other consent compliance tasks		10%		$14,258.40
		Sub-total carried to summary			$14,258.40
2.0	**TDC OPTION SET 3**				
2.1	Remove twin culvert off site	1	LS	$1,200.00	$1,200.00
2.2	Removal of Boyle Street embankment				
2.2.1	*Cut embankment to waste (average 0.4 m deep over 380m length - may be able to use material for new access road to reduce costs)*	152	m^3	$30.00	$4,560.00
2.2.2	*Reinstate surface with topsoil and grass*	304	m^2	$6.00	$1,824.00
2.3	Construct new access road to clubhouse (assume 6m width, 150mm layer of AP65, 150mm layer of AP40)	900	m	$150.00	$135,000
		Sub-total carried to summary			$142,584.00

Pohara Drainage Network Improvement Options

Preliminary Cost Estimate - TDC Option Set 4

Tonkin+Taylor

Rev:	2
Date	15/11/2016
By	TZHL
Checked	DNV

	Summary		
1.0	**PRELIMINARY & GENERAL**	$11,000	
2.0	**TDC OPTION SET 4**	$101,000	
	CONSTRUCTION SUB TOTAL	$112,000	
	CONTINGENCY	$34,000	30%
	CONSTRUCTION TOTAL	**$146,000**	Excl GST

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT
1.0	**PRELIMINARY & GENERAL**				
	All-in allowance to include for consenting, mobilising to site, stream diversion and ESCP and other consent compliance tasks		10%		$10,050.00
		Sub-total carried to summary			$10,050.00
2.0	**TDC OPTION SET 4**				
2.1	Widening of confluence (cut to waste, assuming 0.4m deep typical and 800 m² total disturbed ground)	320	m³	$40.00	$12,800.00
2.2	Selywn St Bund (western end of Selwyn St - 1.5m high typical, 110m long)				
2.2.1	*Strip topsoil and organics and undercut to competent material, stockpile selected soil for topsoiling/landscaping*	220	m³	$15.00	$3,300.00
2.2.2	*Supply and place/compact approved stopbank fill material as per specification*	660	m³	$25.00	$16,500.00
2.2.3	*Reinstate surface with topsoil and grass*	220	m³	$6.00	$1,320.00
2.3	Selywn St bund (eastern end of Selwyn St - 50m long, 1.2m high typical)				
2.3.1	*Strip topsoil and organics and undercut to competent material, stockpile selected soil for topsoiling/landscaping*	82	m³	$15.00	$1,230.00
2.3.2	*Supply and place/compact approved stopbank fill material as per specification*	240	m³	$25.00	$6,000.00
2.3.3	*Reinstate surface with topsoil and grass*	82	m³	$6.00	$492.00
2.4	Remove twin culvert off site	1	LS	$1,200.00	$1,200.00
2.5	Install new box culvert at Boyle Street				
2.5.1	*Supply and place new box culvert (2m x 4m), including foundation preparation*	7	m	$3,500.00	$24,500.00
2.5.2	*Supply and place riprap over geotextile (or similar) protection to inlet and outlet banks/beds*	1	LS	$1,500.00	$1,500.00
2.6	Supply and place Abel Tasman Drive culvert flapgate	1	LS	$6,000.00	$6,000.00
2.7	Bartlett Creek Bund (380m long, typical height 1m)				
2.7.1	*Strip topsoil and organics and undercut to competent material, stockpile selected soil for topsoiling/landscaping*	532	m³	$15.00	$7,980.00

Pohara Drainage Network Improvement Options

Preliminary Cost Estimate - TDC Option Set 4

Tonkin+Taylor

Rev:	2
Date	15/11/2016
By	TZHL
Checked	DNV

	Summary		
1.0	**PRELIMINARY & GENERAL**	$11,000	
2.0	**TDC OPTION SET 4**	$101,000	
	CONSTRUCTION SUB TOTAL	$112,000	
	CONTINGENCY	$34,000	30%
	CONSTRUCTION TOTAL	**$146,000**	Excl GST

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT
2.7.2	*Supply and place/compact approved stopbank fill material as per specification*	1,520	m³	$25.00	$38,000.00
2.7.3	*Reinstate surface with topsoil and grass*	220	m³	$6.00	$1,320.00
2.7.4	*Local reprofiling of SH60 to control direction of overflows*	1	LS	$20,000.00	$20,000.00
		Sub-total carried to summary			$100,500.00

Appendix O: Simulation log

Originating report	Report reference	Mitigation options considered	Modelled storm events
Pohara Subdivision Flooding Investigation (July 2009)		Install additional culvert under Abel Tasman Drive	
		Widening and construct bund at Bartlett Creek	
		Increase 2 farm culvert size along Bartlett Creek	
		Open eastern drain through Kohikiko Place	
Pohara Catchment Stormwater - Issues and Options Assessment (June 2012)	1.1/2.1.1	Enlarge Ellis and Bartlett Creeks	Present day and Year 2090; 20%, 10%, 5%, 2%, 1% AEP
	1.2	Improve maintenance of lower Ellis and Bartlett Creek	
	2.1.1	Construct flood bank to prvent Ellis Creek overflowing into the floodable area	
	2.1.2	Develop and/or extend the detention dam (Lake Raupo) to better attenuate flood flows	
	2.1.3	Construct a pressure pipeline from the detention dam to the beach	
	2.2.2	Provide drainage to Eastern Swale and Spring Creek	
	2.2.3	Construct new pipeline to beach	
	2.2.4	Improve maintenance of existing Western Swales	
	2.4.1	Raise the dwellings that flood	
	2.4.2	Construct a bund along the rear of the fore-dune	
	3.1.1	Improve Culvert 4 inlet and outlet arrangements	
	3.1.2	Upsize Culvert 4	
	3.1.3	Improve maintenance of exting Creeks	
	3.1.4	Improve swale and creek cross-section and capacity	
	4.1	Improve drainage capacity of sinkholes	
	4.2	Develop and manage overland flow path to control overflows	
	4.3	Divert Sinkhole overflow to adjacent catchment E	
Ellis Creek Modelling - Model build and flood hazard mapping (February 2014)		Existing Network	Present day 5% AEP rainfall, MHWS tide (RL 2.27m) Present day 2% AEP rainfall, MHWS tide (RL 2.27m) Present day 1% AEP rainfall, MHWS tide (RL 2.27m) December 2011 event Sunny day, 2090 high tide scenario (present day MHWS tide + 0.8m = RL 3.07m) Present day 1% AEP rainfall, with 0.8m SLR tide (RL 3.07m)
Pohara Stormwater Modelling - Drainage Network Improvement Options (Nov 2016)		Existing network	• Present day 10% AEP rainfall with MHWS tide (RL 2.27m) • Present day 1% AEP rainfall with MHWS tide (RL 2.27m) • Year 2100 10% AEP rainfall with MHWS tide (RL 3.27m) • Year 2100 1% AEP rainfall with MHWS tide (RL 3.27m)
		Proposed RPH development improvements • Bartlett Creek stopbank and road reprofiling	
		TDC network improvement option set 1 • Upgrade of Boyle Street culvert and Kohikiko Place culvert • Installation of flapgate on existing Abel Tasman Culvert • Selywn Street bund near Abel Tasman Drive • Selwyn Street bund near Bartlett Creek-Clifton Creek confluence • Bartlett Creek-Clifton Creek confluence widening	
		TDC network improvement option set 2 • Upgrade Kohikiko Place culvert • Installation of flapgate on existing Abel Tasman Culvert • Selywn Street bund near Abel Tasman Drive • Selwyn Street bund near Bartlett Creek-Clifton Creek confluence • Bartlett Creek-Clifton Creek confluence widening • Removal of Boyle Street culvert and road embankment and install alternate road access to golf clubhouse	
		TDC network improvement option set 3 • Removal of Boyle Street culvert and road embankment and install alternate road access to golf clubhouse	
		TDC network improvement option set 4 • Upgrade of Boyle Street culvert and Kohikiko Place culvert • Installation of flapgate on existing Abel Tasman Culvert • Selywn Street bund near Abel Tasman Drive • Selwyn Street bund near Bartlett Creek-Clifton Creek confluence • Bartlett Creek-Clifton Creek confluence widening • Bartlett Creek stopbank and road reprofiling	