This Right to Information (RTI) response contains detailed flood maps that show potential inundation in the Huon Valley region, should Edgar and/or Scott's Peak dams fail. We want to reassure the community that these scenarios are extremely unlikely. They have been modelled as part of regulatory requirements and emergency management preparation.

Hydro Tasmania shared the maps with the Department of Natural Resources and Environment Tasmania (NRE Tasmania) in 2016. NRE Tasmania collates all such maps in the Tasmanian Government Common Operating Platform, which is accessible to the State Emergency Services (SES) and Tasmania Police. We also provided the maps to the Huon Valley Council and its Emergency Management Committee.

We have consulted with the Huon Valley community around the upgrades for Edgar Dam through community information sessions and an interactive project website. We did not previously publish the maps as they are technical documents created for the regulator and emergency management personnel. We recognise, however, that the local community may have questions about the details contained in this RTI response.

For detailed information on the upgrades to Edgar Dam visit: https://connect.hydro.com.au/edgar-dam-strengthening-project. You are welcome to submit questions or contact our staff directly via this site.

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t 1300 360 441 | f +61 3 6230 5363 | e contactus@hydro.com.au | w www.hydro.com.au

Hydro-Electric Corporation | ABN 48 072 377 158

Chainage 86307 Judbury Bridge	
Time to arrival of flood wave (hh:mm)	7:00
Time to peak flood level (hh:mm)	14:20
Maximum water level rise (m)	13.4
Peak flood level (m AHD)	24.2
Peak flow (m3/s)	5680

Chainage 90869 Glen Huon	
Time to arrival of flood wave (hh:mm)	9:20
Time to peak flood level (hh:mm)	14:30
Maximum water level rise (m)	11.8
Peak flood level (m AHD)	16.2
Peak flow (m3/s)	5670

Chainage 100333 Huonville	
Time to arrival of flood wave (hh:mm)	10:30
Time to peak flood level (hh:mm)	16:55
Maximum water level rise (m)	7.4
Peak flood level (m AHD)	7.5
Peak flow (m3/s)	5520

INSET A
Scale 1:15,000
0 100 200 m

See Inset A

LEGEND

Depth in metres

0.00 - 1.00	5.00 - 6.00	10.00 - 11.00
1.00 - 2.00	6.00 - 7.00	11.00 - 12.00
2.00 - 3.00	7.00 - 8.00	12.00- 13.00
3.00 - 4.00	8.00 - 9.00	13.00- 14.00
4.00 - 5.00	9.00 - 10.00	

- Major / minor road
- Creek or river
- Transmission line infrastructure
- Major / minor contour
- Building / Building with surveyed floor level
- Community facility

Huon River Dambreak Inundation Mapping

Edgar Dam - Earthquake Failure

Sheet 1 of 2

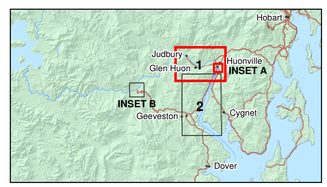
Revision: 0
Date Produced: May 2014
Plan Reference: P507315_GIS01

0 1 2 3 Kilometres

Scale: 1:25,000

Prepared by: Steve Thomas
Approved by: Michael Wallis
Datum: GDA94, Projection: MGA Zone 55

LOCALITY MAP



GENERAL

This map is to be read in conjunction with the Scotts Peak Dam and Edgar Dam Earthquake Loading Consequence Assessment report (Entura – 6DAA6, May 2014).

This map delineates populated areas on the Huon River that are subject to inundation by floods from an upstream dambreak of Edgar Dam resulting from a major earthquake event.

The extent of flooding shown on the map upstream of the Judbury Bridge is approximate only as it is based on 10 m contour information.

The limits of inundation shown for the earthquake dambreak scenario are not boundaries between flood prone and flood-free zones. Areas outside the limits shown could well be inundated during the event.

The estimates of the flood levels may change with future analysis as a result of changed dam breach parameters (i.e. breach width, side slopes and breach time), changes in assumed inflows along the river, river geomorphology, smaller grid size in the two dimensional area modelled, changes in the assumed downstream boundary water level (i.e. tide level) or due to modelling software and techniques.

Flood and dambreak inundation water levels were based on a combination of results from a MIKE 11 one-dimensional hydraulic model and a MIKE 21 two-dimensional hydraulic model.

Cross sections for hydraulic modelling were extracted from 1:25 000 scale, 10 m contour interval maps, surveying at Judbury and Huonville Bridges and LiDAR. Bathymetric data for the Huon River between Chainage 95040 m and the downstream end of the model was obtained from a single pass survey by boat in January 2014.
Edgar Dam breach parameters:
- Average breach width: 336 m
- Side slopes: 1 vertical : 3.8 horizontal
- Breach time: 1.0 hours

Downstream boundary water level: 0.062 mAHD
(mean sea level at Hobart)
MIKE 21 model (two-dimensional): 16 m square
Lake Pedder level: initial level at Full Supply Level 308.46 mAHD

DATA REFERENCES
- Height datum: Australian Height Datum (Tasmania).
- Building data set compiled from floor level survey in 2007, additional buildings digitised from aerial photography in 2004/05 and revised in 2014 from Google Earth imagery (indicative only and may contain omissions).
- Roads, rivers, water bodies, contours: base data from theLIST (www.thelist.tas.gov.au) © State of Tasmania.
- LiDAR: from Climate Futures LiDAR Dataset.
- Hydraulic modelling undertaken in 2014.
- Hydraulic models and results stored by Entura (reference E303693-P507315).

EXPLANATION OF TERMS

Chainage:
- The distance in metres from Scotts Peak Dam to that location along the Huon River.

Earthquake failure:
- Dam commences failing immediately after major earthquake event during sunny day conditions (no rainfall, very low inflows)
- Storage starts at FSL (Full Supply Level).

Time to arrival of flood wave:
- Time from initiation of dam breach to arrival of flood wave (i.e. when water level starts to significantly rise).

Time to peak flood level:
- Modelled time from initiation of dam breach to peak flood level.

Maximum water level rise:
- Maximum water level increase (from low river conditions, or Full Supply Level in lakes) caused by dambreak flood wave.

Peak flood level:
- Highest modelled flood level caused by dambreak flood wave.

Peak flow:
- Highest modelled flow caused by dambreak flood wave.

Prepared For :

Hydro Tasmania
The power of natural thinking

Prepared By :

entura Hydro Tasmania | The power of natural thinking

Hydraulic modelling undertaken by Civil Team and spatial mapping compiled and presented by Water & Environment Team.

INSET B
Scale 1:20,000
0 250 500 m

Chainage 60858 Tahune Forest Reserve	
Time to arrival of flood wave (hh:mm)	3:30
Time to peak flood level (hh:mm)	9:15
Maximum water level rise (m)	12.0
Peak flood level (m AHD)	62.0
Peak flow (m3/s)	5874

Chainage 107899 Franklin	
Time to arrival of flood wave (hh:mm)	10:55
Time to peak flood level (hh:mm)	18:55
Maximum water level rise (m)	4.5
Peak flood level (m AHD)	4.6
Peak flow (m3/s)	5435

Chainage 116054 Port Huon	
Time to arrival of flood wave (hh:mm)	11:25
Time to peak flood level (hh:mm)	20:30
Maximum water level rise (m)	1.0
Peak flood level (m AHD)	1.1
Peak flow (m3/s)	5432

GENERAL

This map is to be read in conjunction with the Scotts Peak Dam and Edgar Dam Earthquake Loading Consequence Assessment report (Entura – 6DAA6, May 2014).

This map delineates populated areas on the Huon River that are subject to inundation by floods from an upstream dambreak of Edgar Dam resulting from a major earthquake event.

The extent of flooding shown on the map upstream of the Judbury Bridge is approximate only as it is based on 10 m contour information.

The limits of inundation shown for the earthquake dambreak scenario are not boundaries between flood prone and flood-free zones. Areas outside the limits shown could well be inundated during the event.

The estimates of the flood levels may change with future analysis as a result of changed dam breach parameters (i.e. breach width, side slopes and breach time), changes in assumed inflows along the river, river geomorphology, smaller grid size in the two dimensional area modelled, changes in the assumed downstream boundary water level (i.e. tide level) or due to modelling software and techniques.

Flood and dambreak inundation water levels were based on a combination of results from a MIKE 11 one-dimensional hydraulic model and a MIKE 21 two-dimensional hydraulic model.

Cross sections for hydraulic modelling were extracted from 1:25 000 scale, 10 m contour interval maps, surveying at Judbury and Huonville Bridges and LiDAR. Bathymetric data for the Huon River between Chainage 95040 m and the downstream end of the model was obtained from a single pass survey by boat in January 2014.
Edgar Dam breach parameters:
- Average breach width: 336 m
- Side slopes: 1 vertical : 3.8 horizontal
- Breach time: 1.0 hours

Downstream boundary water level: 0.062 mAHD
(mean sea level at Hobart)
MIKE 21 model (two-dimensional): 16 m square
Lake Pedder level: initial level at Full Supply Level 308.46 mAHD

DATA REFERENCES
- Height datum: Australian Height Datum (Tasmania).
- Building data set compiled from floor level survey in 2007, additional buildings digitised from aerial photography in 2004/05 and revised in 2014 from Google Earth imagery (indicative only and may contain omissions).
- Roads, rivers, water bodies, contours: base data from theLIST (www.thelist.tas.gov.au) © State of Tasmania.
- LiDAR: from Climate Futures LiDAR Dataset.
- Hydraulic modelling undertaken in 2014.
- Hydraulic models and results stored by Entura (reference E303693-P507315).

EXPLANATION OF TERMS

Chainage:
- The distance in metres from Scotts Peak Dam to that location along the Huon River.

Earthquake failure:
- Dam commences failing immediately after major earthquake event during sunny day conditions (no rainfall, very low inflows)
- Storage starts at FSL (Full Supply Level).

Time to arrival of flood wave:
- Time from initiation of dam breach to arrival of flood wave (i.e. when water level starts to significantly rise).

Time to peak flood level:
- Modelled time from initiation of dam breach to peak flood level.

Maximum water level rise:
- Maximum water level increase (from low river conditions, or Full Supply Level in lakes) caused by dambreak flood wave.

Peak flood level:
- Highest modelled flood level caused by dambreak flood wave.

Peak flow:
- Highest modelled flow caused by dambreak flood wave.

LEGEND

Major / minor road
Creek or river
Transmission line infrastructure
Major / minor contour
Building / Building with surveyed floor level / Community facility

Depth in metres
0.00 - 1.00
1.00 - 2.00
2.00 - 3.00
3.00 - 4.00
4.00 - 5.00
5.00 - 6.00
6.00 - 7.00
7.00 - 8.00
8.00 - 9.00
9.00 - 10.00
10.00 - 11.00
11.00 - 12.00
12.00 - 13.00
13.00 - 14.00

Huon River Dambreak Inundation Mapping

Edgar Dam - Earthquake Failure

Sheet 2 of 2

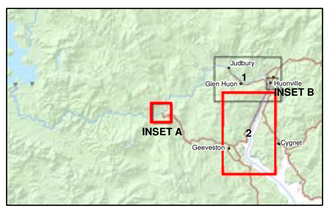
Revision: 0
Date Produced: May 2014
Plan Reference: P507315_GIS01

0 0.5 1 2 Kilometres

Scale: 1:25,000

Prepared by: Steve Thomas
Approved by: Michael Wallis
Datum: GDA94, Projection: MGA Zone 55

LOCALITY MAP



Prepared For :
Hydro Tasmania
The power of natural thinking

Prepared By :
entura Hydro Tasmania | The power of natural thinking

Hydraulic modelling undertaken by Civil Team and spatial mapping compiled and presented by Water & Environment Team.

Chainage 86307 Judbury Bridge	
Time to arrival of flood wave (hh:mm)	7:00
Time to first peak flood level (hh:mm)	14:20
First peak maximum water level rise (m)	13.4
First peak flood level (m AHD)	24.2
Time to second peak flood level (hh:mm)	56:40
Second peak maximum water level rise (m)	20.9
Second peak flood level (m AHD)	31.6
Peak flow (m3/s)	18846

Chainage 90869 Glen Huon	
Time to arrival of flood wave (hh:mm)	9:20
Time to first peak flood level (hh:mm)	14:30
First peak maximum water level rise (m)	11.8
First peak flood level (m AHD)	16.2
Time to second peak flood level (hh:mm)	57:05
Second peak maximum water level rise (m)	17.7
Second peak flood level (m AHD)	22.1
Peak flow (m3/s)	18700

Chainage 100333 Huonville	
Time to arrival of flood wave (hh:mm)	10:30
Time to first peak flood level (hh:mm)	16:55
First peak maximum water level rise (m)	7.4
First peak flood level (m AHD)	7.5
Time to second peak flood level (hh:mm)	58:05
Second peak maximum water level rise (m)	12.9
Second peak flood level (m AHD)	13.0
Peak flow (m3/s)	17730

INSET A
Scale 1:15,000
0 100 200 m

See Inset A

LEGEND

Depth in metres

0.00 - 1.00	5.00 - 6.00	11.00 - 12.00	17.00 - 18.00
1.00 - 2.00	6.00 - 7.00	12.00 - 13.00	18.00 - 19.00
2.00 - 3.00	7.00 - 8.00	13.00 - 14.00	19.00 - 20.00
3.00 - 4.00	8.00 - 9.00	14.00 - 15.00	20.00 - 21.00
4.00 - 5.00	9.00 - 10.00	15.00 - 16.00	
	10.00 - 11.00	16.00 - 17.00	

Major / minor road
Creek or river
Transmission line infrastructure
Major / minor contour
Building / Building with surveyed floor level
Community facility

Huon River Dambreak Inundation Mapping

Edgar & Scotts Peak Dam - Earthquake Failure

Sheet 1 of 2

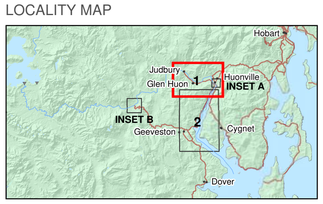
Revision: 0
Date Produced: May 2014
Plan Reference: P507315_GIS01

0 0.5 1 2 3 4 Kilometres

Scale: 1:25,000

Prepared by: Steve Thomas
Approved by: Michael Wallis
Datum: GDA94, Projection: MGA Zone 55

LOCALITY MAP



GENERAL

This map is to be read in conjunction with the Scotts Peak Dam and Edgar Dam Earthquake Loading Consequence Assessment report (Entura – 6DAA6, May 2014).

This map delineates populated areas on the Huon River that are subject to inundation by floods from an upstream dambreak of both Edgar Dam and Scotts Peak Dam resulting from a major earthquake event.

The extent of flooding shown on the map upstream of the Judbury Bridge is approximate only as it is based on 10 m contour information.

The limits of inundation shown for the earthquake dambreak scenario are not boundaries between flood prone and flood-free zones. Areas outside the limits shown could be inundated during the event.

The estimates of the flood levels may change with future analysis as a result of changed dam breach parameters (i.e. breach width, side slopes and breach time), changes in assumed inflows along the river, river geomorphology, smaller grid size in the two dimensional area modelled, changes in the assumed downstream boundary water level (i.e. tide level) or due to modelling software and techniques.

Flood and dambreak inundation water levels were based on a combination of results from a MIKE 11 one-dimensional hydraulic model and a MIKE 21 two-dimensional hydraulic model.

Cross sections for hydraulic modelling were extracted from 1:25 000 scale, 10 m contour interval maps, surveying at Judbury and Huonville Bridges and LiDAR. Bathymetric data for the Huon River between Chainage 95040 m and the downstream end of the model was obtained from a single pass survey by boat in January 2014.

Edgar Dam breach parameters:
- Average breach width: 336 m
- Side slopes: 1 vertical : 3.8 horizontal
- Breach time: 1.0 hours

Scotts Peak Dam breach parameters:
- Average breach width: 150 m
- Side slopes: 1 vertical : 1 horizontal
- Breach time: 1.5 hours

Downstream boundary water level: 0.062 mAHD
(mean sea level at Hobart)
MIKE 21 model (two-dimensional): 16 m square
Lake Pedder level: initial level at Full Supply Level 308.46 mAHD

DATA REFERENCES
- Height datum: Australian Height Datum (Tasmania).
- Building data set compiled from floor level survey in 2007, additional buildings digitised from aerial photography in 2004/05 and revised in 2014 from Google Earth imagery (indicative only and may contain omissions).
- Roads, rivers, water bodies, contours: base data from theLIST (www.thelist.tas.gov.au) © State of Tasmania.
- LiDAR: from Climate Futures LiDAR Dataset.
- Hydraulic modelling undertaken in 2014.
- Hydraulic models and results stored by Entura (reference E303693-P507315).

EXPLANATION OF TERMS

Chainage:
- The distance in metres from Scotts Peak Dam to that location along the Huon River.

Earthquake failure:
- Edgar Dam commences failing immediately following a major earthquake event with Scotts Peak Dam failing 48 hours after major earthquake event during sunny day conditions (no rainfall, very low inflows)
- Storage starts at FSL (Full Supply Level).

Time to arrival of flood wave:
- Time from initiation of Edgar Dam breach to arrival of flood wave (i.e. when water level starts to significantly rise).

Time to first peak flood level:
- Modelled time from initiation of Edgar Dam breach to first peak flood level.

Time to second peak flood level:
- Modelled time from initiation of Edgar Dam breach to second peak flood level.

First peak water level rise:
- Maximum water level increase to first peak (from low river conditions, or Full Supply Level in lakes) caused by dambreak flood wave.

Peak flood level:

Second peak water level rise:
- Maximum water level increase to second peak (from low river conditions, or Full Supply Level in lakes) caused by dambreak flood wave.

Peak flood level:
- Highest modelled flood level caused by dambreak flood wave.

Peak flow:
- Highest modelled flow caused by dambreak flood wave.

Prepared For :

Hydro Tasmania
The power of natural thinking

Prepared By :

entura Hydro Tasmania | The power of natural thinking

Hydraulic modelling undertaken by Civil Team and spatial mapping compiled and presented by Water & Environment Team.

INSET B
Scale 1:20,000
0 250 500 m

Chainage 60858 Tahune Forest Reserve	
Time to arrival of flood wave (hh:mm)	3:30
Time to first peak flood level (hh:mm)	9:15
First peak maximum water level rise (m)	12.0
First peak flood level (m AHD)	62.0
Time to second peak flood level (hh:mm)	53:50
Second peak maximum water level rise (m)	19.6
Second peak flood level (m AHD)	69.6
Peak flow (m3/s)	21875

Chainage 107899 Franklin	
Time to arrival of flood wave (hh:mm)	10:55
Time to first peak flood level (hh:mm)	18:55
First peak maximum water level rise (m)	4.5
First peak flood level (m AHD)	4.6
Time to second peak flood level (hh:mm)	58:50
Second peak maximum water level rise (m)	8.4
Second peak flood level (m AHD)	8.5
Peak flow (m3/s)	17230

Chainage 116054 Port Huon	
Time to arrival of flood wave (hh:mm)	11:25
Time to first peak flood level (hh:mm)	20:30
First peak maximum water level rise (m)	1.0
First peak flood level (m AHD)	1.1
Time to second peak flood level (hh:mm)	59:50
Second peak maximum water level rise (m)	3.3
Second peak flood level (m AHD)	3.4
Peak flow (m3/s)	16900

GENERAL

This map is to be read in conjunction with the Scotts Peak Dam and Edgar Dam Earthquake Loading Consequence Assessment report (Entura – 6DAA6, May 2014).

This map delineates populated areas on the Huon River that are subject to inundation by floods from an upstream dambreak of both Edgar Dam and Scotts Peak Dam resulting from a major earthquake event.

The extent of flooding shown on the map upstream of the Judbury Bridge is approximate only as it is based on 10 m contour information.

The limits of inundation shown for the earthquake dambreak scenario are not boundaries between flood prone and flood-free zones. Areas outside the limits shown could well be inundated during the event.

The estimates of the flood levels may change with future analysis as a result of changed dam breach parameters (i.e. breach width, side slopes and breach time), changes in assumed inflows along the river, river geomorphology, smaller grid size in the two dimensional area modelled, changes in the assumed downstream boundary water level (i.e. tide level) or due to modelling software and techniques.

Flood and dambreak inundation water levels were based on a combination of results from a MIKE 11 one-dimensional hydraulic model and a MIKE 21 two-dimensional hydraulic model.

Cross sections for hydraulic modelling were extracted from 1:25 000 scale, 10 m contour interval maps, surveying at Judbury and Huonville Bridges and LiDAR. Bathymetric data for the Huon River between Chainage 95040 m and the downstream end of the model was obtained from a single pass survey by boat in January 2014.

Edgar Dam breach parameters:
- Average breach width: 336 m
- Side slopes: 1 vertical : 3.8 horizontal
- Breach time: 1.0 hours

Scotts Peak Dam breach parameters:
- Average breach width: 150 m
- Side slopes: 1 vertical : 1 horizontal
- Breach time: 1.5 hours

Downstream boundary water level: 0.062 mAHD
(mean sea level at Hobart)
MIKE 21 model (two-dimensional): 16 m square
Lake Pedder level: initial level at Full Supply Level 308.46 mAHD

DATA REFERENCES
- Height datum: Australian Height Datum (Tasmania).
- Building data set compiled from floor level survey in 2007, additional buildings digitised from aerial photography in 2004/05 and revised in 2014 from Google Earth imagery (indicative only and may contain omissions).
- Roads, rivers, water bodies, contours: base data from theLIST (www.thelist.tas.gov.au) © State of Tasmania.
- LiDAR: from Climate Futures LiDAR Dataset.
- Hydraulic modelling undertaken in 2014.
- Hydraulic models and results stored by Entura (reference E303693-P507315).

EXPLANATION OF TERMS

Chainage:
- The distance in metres from Scotts Peak Dam to that location along the Huon River.

Earthquake failure:
- Edgar Dam commences failing immediately following a major earthquake event with Scotts Peak Dam failing 48 hours after major earthquake event during sunny day conditions (no rainfall, very low inflows)
- Storage starts at FSL (Full Supply Level).

Time to arrival of flood wave:
- Time from initiation of Edgar Dam breach to arrival of flood wave (i.e. when water level starts to significantly rise).

Time to first peak flood level:
- Modelled time from initiation of Edgar Dam breach to first peak flood level.

Time to second peak flood level:
- Modelled time from initiation of Edgar Dam breach to second peak flood level.

First peak water level rise:
- Maximum water level increase to first peak (from low river conditions, or Full Supply Level in lakes) caused by dambreak flood wave.

Peak flood level:

Second peak water level rise:
- Maximum water level increase to second peak (from low river conditions, or Full Supply Level in lakes) caused by dambreak flood wave.

Peak flood level:
- Highest modelled flood level caused by dambreak flood wave.

Peak flow:
- Highest modelled flow caused by dambreak flood wave.

LEGEND

Major / minor road
Transmission line infrastructure
Creek or river
Major / minor contour
Building / Building with surveyed floor level / Community facility

Depth in metres

0.00 - 1.00	4.00 - 5.00	9.00 - 10.00	14.00 - 15.00	19.00 - 20.00
1.00 - 2.00	5.00 - 6.00	10.00 - 11.00	15.00 - 16.00	20.00 - 21.00
2.00 - 3.00	6.00 - 7.00	11.00 - 12.00	16.00 - 17.00	
3.00 - 4.00	7.00 - 8.00	12.00 - 13.00	17.00 - 18.00	
	8.00 - 9.00	13.00 - 14.00	18.00 - 19.00	

Huon River Dambreak Inundation Mapping

Edgar & Scotts Peak Dam - Earthquake Failure

Sheet 2 of 2

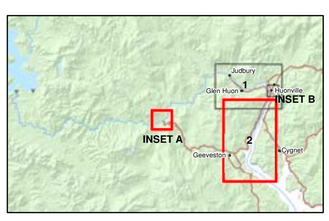
Revision: 0
Date Produced: May 2014
Plan Reference: P507315_GIS01

0 0.5 1 2 Kilometres

Scale: 1:25,000

Prepared by: Steve Thomas
Approved by: Michael Wallis
Datum: GDA94, Projection: MGA Zone 55

LOCALITY MAP



Prepared For :

Hydro Tasmania
The power of natural thinking

Prepared By :

entura Hydro Tasmania | The power of natural thinking

Hydraulic modelling undertaken by Civil Team and spatial mapping compiled and presented by Water & Environment Team.

Chainage 86307 Judbury Bridge	
Time to arrival of flood wave (hh:mm)	5:00
Time to peak flood level (hh:mm)	9:25
Maximum water level rise (m)	22.4
Peak flood level (m AHD)	33.2
Peak flow (m3/s)	23600

Chainage 90869 Glen Huon	
Time to arrival of flood wave (hh:mm)	6:20
Time to peak flood level (hh:mm)	9:40
Maximum water level rise (m)	19.0
Peak flood level (m AHD)	23.5
Peak flow (m3/s)	23500

Chainage 100333 Huonville	
Time to arrival of flood wave (hh:mm)	7:20
Time to peak flood level (hh:mm)	10:55
Maximum water level rise (m)	14.4
Peak flood level (m AHD)	14.5
Peak flow (m3/s)	22260

INSET A
Scale 1:15,000
0 100 200 m

See Inset A

LEGEND

Depth in metres

0.00 - 1.00	5.00 - 6.00	11.00 - 12.00	17.00 - 18.00
1.00 - 2.00	6.00 - 7.00	12.00 - 13.00	18.00 - 19.00
2.00 - 3.00	7.00 - 8.00	13.00 - 14.00	19.00 - 20.00
3.00 - 4.00	8.00 - 9.00	14.00 - 15.00	20.00 - 21.00
4.00 - 5.00	9.00 - 10.00	15.00 - 16.00	21.00 - 22.00
	10.00 - 11.00	16.00 - 17.00	22.00 - 23.00

- Major / minor road
- Creek or river
- Transmission line infrastructure
- Major / minor contour
- Building / Building with surveyed floor level
- Community facility

Huon River Dambreak Inundation Mapping

Scotts Peak Dam - Earthquake Failure

Sheet 1 of 2

Revision: 0
Date Produced: May 2014
Plan Reference: P507315_GIS01

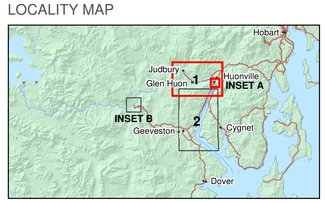
0 0.5 1 2 3 4 Kilometres

Scale: 1:25,000

Prepared by: Steve Thomas
Approved by: Michael Wallis
Datum: GDA94, Projection: MGA Zone 55

N W E S

LOCALITY MAP



GENERAL

This map is to be read in conjunction with the Scotts Peak Dam and Edgar Dam Earthquake Loading Consequence Assessment report (Entura – 6DAA6, May 2014).

This map delineates populated areas on the Huon River that are subject to inundation by floods from an upstream dambreak of Scotts Peak Dam resulting from a major earthquake event.

The extent of flooding shown on the map upstream of the Judbury Bridge is approximate only as it is based on 10 m contour information.

The limits of inundation shown for the earthquake dambreak scenario are not boundaries between flood prone and flood-free zones. Areas outside the limits shown could well be inundated during the event.

The estimates of the flood levels may change with future analysis as a result of changed dam breach parameters (i.e. breach width, side slopes and breach time), changes in assumed inflows along the river, river geomorphology, smaller grid size in the two dimensional area modelled, changes in the assumed downstream boundary water level (i.e. tide level) or due to modelling software and techniques.

Flood and dambreak inundation water levels were based on a combination of results from a MIKE 11 one-dimensional hydraulic model and a MIKE 21 two-dimensional hydraulic model.

Cross sections for hydraulic modelling were extracted from 1:25 000 scale, 10 m contour interval maps, surveying at Judbury and Huonville Bridges and LiDAR. Bathymetric data for the Huon River between Chainage 95040 m and the downstream end of the model was obtained from a single pass survey by boat in January 2014.

Scotts Peak Dam breach parameters:
- Average breach width: 150 m
- Side slopes: 1 vertical : 1 horizontal
- Breach time: 1.5 hours

Downstream boundary water level: 0.062 mAHD
(mean sea level at Hobart)
MIKE 21 model (two-dimensional): 16 m square
Lake Pedder level: initial level at Full Supply Level 308.46 mAHD

DATA REFERENCES
- Height datum: Australian Height Datum (Tasmania).
- Building data set compiled from floor level survey in 2007, additional buildings digitised from aerial photography in 2004/05 and revised in 2014 from Google Earth imagery (indicative only and may contain omissions).
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- LiDAR: from Climate Futures LiDAR Dataset.
- Hydraulic modelling undertaken in 2014.
- Hydraulic models and results stored by Entura (reference E303693-P507315).

EXPLANATION OF TERMS

Chainage:
- The distance in metres from Scotts Peak Dam to that location along the Huon River.

Earthquake failure:
- Dam commences failing 48 hours after major earthquake event during sunny day conditions (no rainfall, very low inflows)
- Storage starts at FSL (Full Supply Level).

Time to arrival of flood wave:
- Time from initiation of dam breach to arrival of flood wave (i.e. when water level starts to significantly rise).

Time to peak flood level:
- Modelled time from initiation of dam breach to peak flood level.

Maximum water level rise:
- Maximum water level increase (from low river conditions, or Full Supply Level in lakes) caused by dambreak flood wave.

Peak flood level:
- Highest modelled flood level caused by dambreak flood wave.

Peak flow:
- Highest modelled flow caused by dambreak flood wave.

Prepared For :

Hydro Tasmania
The power of natural thinking

Prepared By :

entura Hydro Tasmania | The power of natural thinking

Hydraulic modelling undertaken by Civil Team and spatial mapping compiled and presented by Water & Environment Team.

INSET B
Scale 1:20,000
0 250 500 m

Chainage 60858 Tahune Forest Reserve	
Time to arrival of flood wave (hh:mm)	2:40
Time to peak flood level (hh:mm)	6:25
Maximum water level rise (m)	21.0
Peak flood level (m AHD)	71.0
Peak flow (m3/s)	27000

Chainage 107899 Franklin	
Time to arrival of flood wave (hh:mm)	7:45
Time to peak flood level (hh:mm)	11:50
Maximum water level rise (m)	9.5
Peak flood level (m AHD)	9.6
Peak flow (m3/s)	21670

Chainage 116054 Port Huon	
Time to arrival of flood wave (hh:mm)	8:15
Time to peak flood level (hh:mm)	12:40
Maximum water level rise (m)	4.0
Peak flood level (m AHD)	3.9
Peak flow (m3/s)	21442

GENERAL

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Peak flood level:
- Highest modelled flood level caused by dambreak flood wave.

Peak flow:
- Highest modelled flow caused by dambreak flood wave.

LEGEND

Major / minor road
Creek or river
Transmission line infrastructure
Major / minor contour
Building / Building with surveyed floor level / Community facility

Depth in metres

0.00 - 1.00	4.00 - 5.00	9.00 - 10.00	14.00 - 15.00	19.00 - 20.00
1.00 - 2.00	5.00 - 6.00	10.00 - 11.00	15.00 - 16.00	20.00 - 21.00
2.00 - 3.00	6.00 - 7.00	11.00 - 12.00	16.00 - 17.00	21.00 - 22.00
3.00 - 4.00	7.00 - 8.00	12.00 - 13.00	17.00 - 18.00	22.00 - 23.00
	8.00 - 9.00	13.00 - 14.00	18.00 - 19.00	

Huon River Dambreak Inundation Mapping

Scotts Peak Dam - Earthquake Failure

Sheet 2 of 2

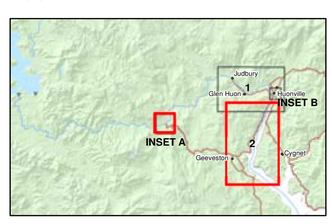
Revision: 0
Date Produced: May 2014
Plan Reference: P507315_GIS01

0 0.5 1 2 Kilometres

Scale: 1:25,000

Prepared by: Steve Thomas
Approved by: Michael Wallis
Datum: GDA94, Projection: MGA Zone 55

LOCALITY MAP



Prepared For :

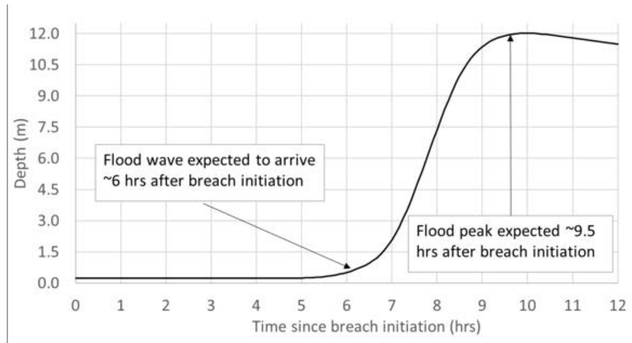
Hydro Tasmania
The power of natural thinking

Prepared By :

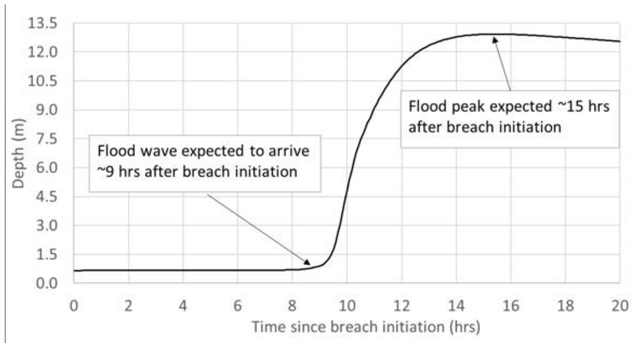
entura Hydro Tasmania | The power of natural thinking

Hydraulic modelling undertaken by Civil Team and spatial mapping compiled and presented by Water & Environment Team.

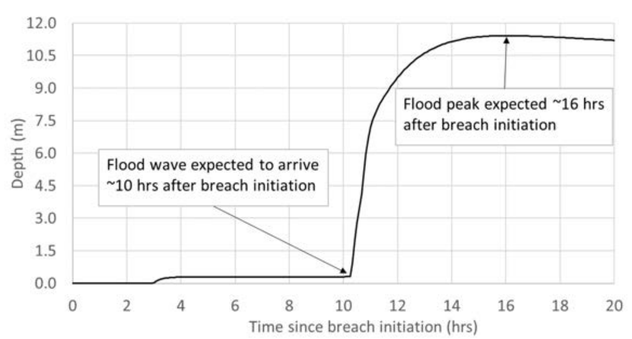
Tahune



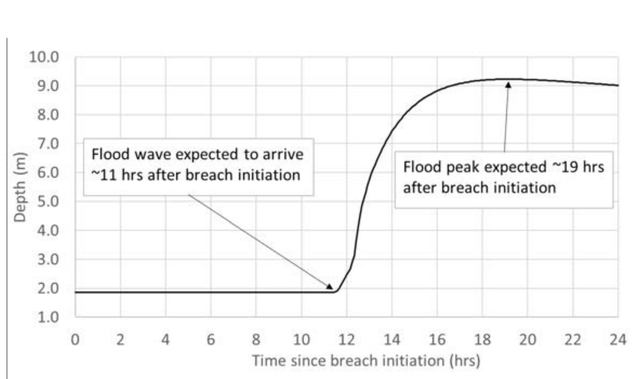
Judbury



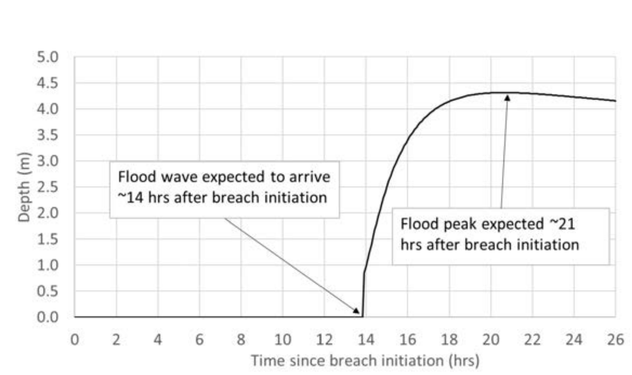
Glen Huon



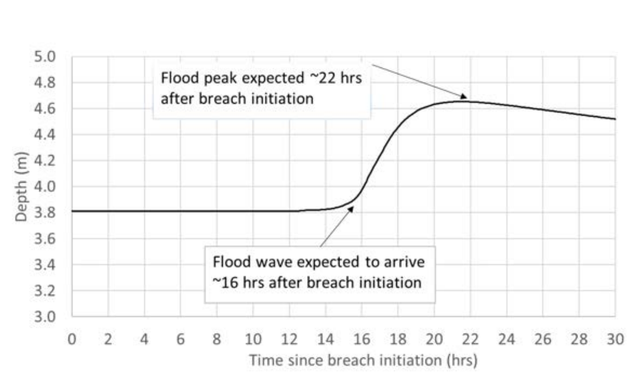
Huonville



Franklin



Port Huon



Huon River Dambreak Inundation Mapping

Edgar Dam - Earthquake Failure Advancing Hydrographs

Sheet 1 of 1

Revision: 0
Date Produced: June 2021
Plan Reference: P507315_GIS01

Prepared by: Alice Hines
Approved by: Craig Ludlow
Datum: GDA94, Projection: MGA Zone 55

GENERAL

This map is to be read in conjunction with the Scotts Peak Dam and Edgar Dam Earthquake Loading Consequence Assessment report (Entura – 6DAA6, May 2014).

This map depicts advancing hydrographs at key populated areas on the Huon River that are subject to inundation by flood from an upstream dambreak of Edgar Dam resulting from a major earthquake event.

Inundation depths depicted in hydrographs are indicative only and based on depths in the river channel, not the overbank areas. Refer to inundation maps for peak flood depths at locations of interest.

The estimates of the flood levels may change with future analysis as a result of changed dam breach parameters (i.e. breach width, side slopes and breach time), changes in assumed inflows along the river, river geomorphology, smaller grid size in the two dimensional area modelled, changes in the assumed downstream boundary water level (i.e. tide level) or due to modelling software and techniques.

Flood and dambreak inundation water levels were based on a combination of results from a MIKE 11 one-dimensional hydraulic model and a MIKE 21 two-dimensional hydraulic model.

Cross sections for hydraulic modelling were extracted from 1:25 000 scale, 10 m contour interval maps, surveying at Judbury and Huonville Bridges and LiDAR. Bathymetric data for the Huon River between Chainage 95040 m and the downstream end of the model was obtained from a single pass survey by boat in January 2014.
Edgar Dam breach parameters:
- Average breach width: 336 m
- Side slopes: 1 vertical : 3.8 horizontal
- Breach time: 1.0 hours

Downstream boundary water level: 0.062 mAHD (mean sea level at Hobart)
MIKE 21 model (two-dimensional): 16 m square
Lake Pedder level: initial level at Full Supply Level 308.46 mAHD

DATA REFERENCES
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- Hydraulic modelling undertaken in 2014.
- Hydraulic models and results stored by Entura (reference E303693-P507315).

EXPLANATION OF TERMS

Chainage:
- The distance in metres from Scotts Peak Dam to that location along the Huon River.

Earthquake failure:
- Dam commences failing after major earthquake event during sunny day conditions (no rainfall, very low inflows)
- Lake Pedder is at FSL (Full Supply Level) at the time of dam failure.

Prepared For :

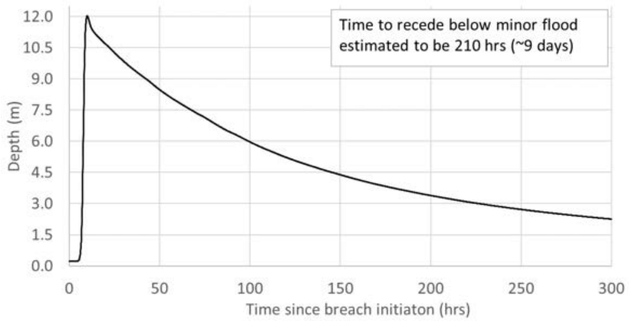
Hydro Tasmania
The power of natural thinking

Prepared By :

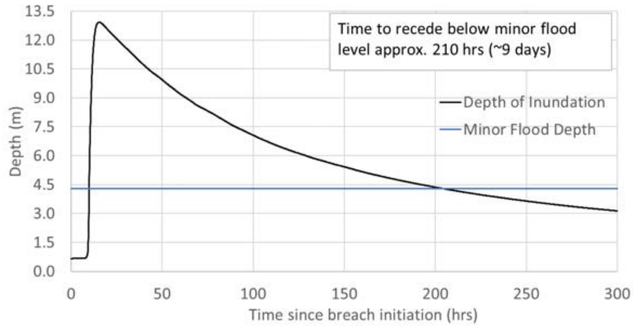
entura Hydro Tasmania | The power of natural thinking

Hydraulic modelling undertaken by Civil Team and spatial mapping compiled and presented by Water & Environment Team.

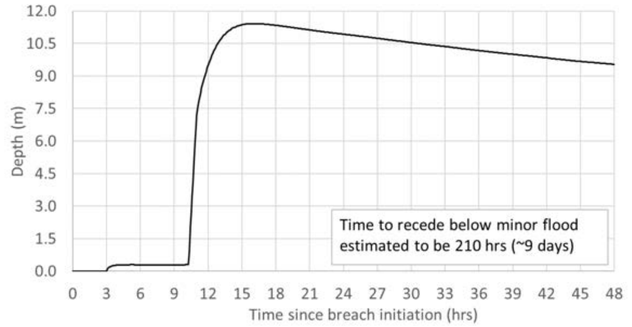
Tahune



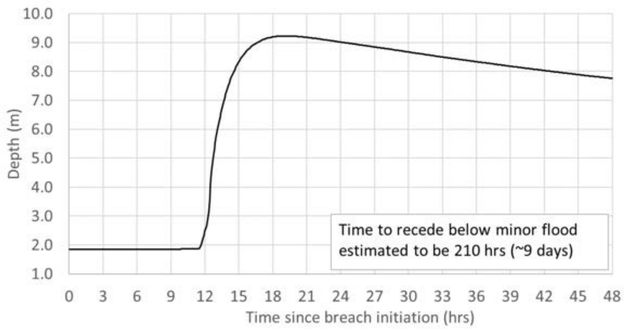
Judbury



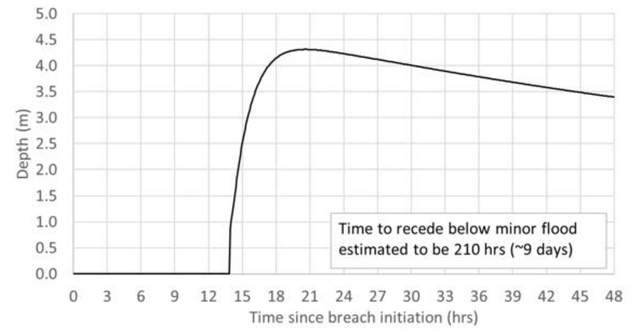
Glen Huon



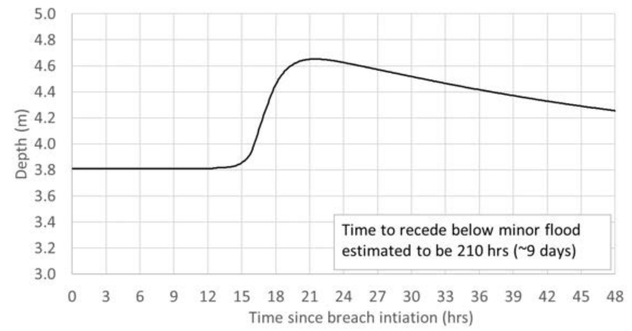
Huonville



Franklin



Port Huon



GENERAL

This map is to be read in conjunction with the Scotts Peak Dam and Edgar Dam Earthquake Loading Consequence Assessment report (Entura – 6DAA6, May 2014).

This map depicts retreating hydrographs at key populated areas on the Huon River that are subject to inundation by flood from an upstream dambreak of Edgar Dam resulting from a major earthquake event.

Inundation depths depicted in hydrographs are indicative only and based on depths in the river channel, not the overbank areas. Refer to inundation maps for peak flood depths at locations of interest.

The estimates of the flood levels may change with future analysis as a result of changed dam breach parameters (i.e. breach width, side slopes and breach time), changes in assumed inflows along the river, river geomorphology, smaller grid size in the two dimensional area modelled, changes in the assumed downstream boundary water level (i.e. tide level) or due to modelling software and techniques.

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- Breach time: 1.0 hours

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(mean sea level at Hobart)
MIKE 21 model (two-dimensional): 16 m square
Lake Pedder level: initial level at Full Supply Level 308.46 mAHD

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- Hydraulic modelling undertaken in 2014.
- Hydraulic models and results stored by Entura (reference E303693-P507315).

EXPLANATION OF TERMS

Chainage:
- The distance in metres from Scotts Peak Dam to that location along the Huon River.

Earthquake failure:
- Dam commences failing after major earthquake event during sunny day conditions (no rainfall, very low inflows)
- Lake Pedder is at FSL (Full Supply Level) at the time of dam failure.

Huon River Dambreak Inundation Mapping

Edgar Dam - Earthquake Failure Retreating Hydrographs

Sheet 1 of 1

Revision: 0
Date Produced: June 2021
Plan Reference: P507315_GIS01

Prepared by: Alice Hines
Approved by: Craig Ludlow
Datum: GDA94, Projection: MGA Zone 55

Prepared For :

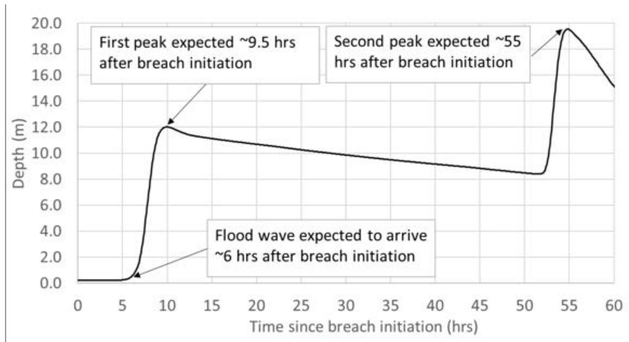
Hydro Tasmania
The power of natural thinking

Prepared By :

entura Hydro Tasmania | The power of natural thinking

Hydraulic modelling undertaken by Civil Team and spatial mapping compiled and presented by Water & Environment Team.

Tahune



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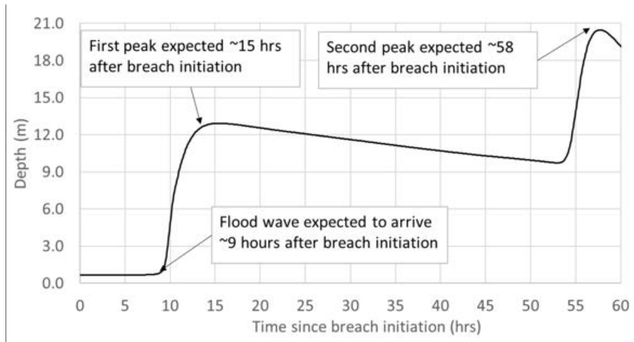
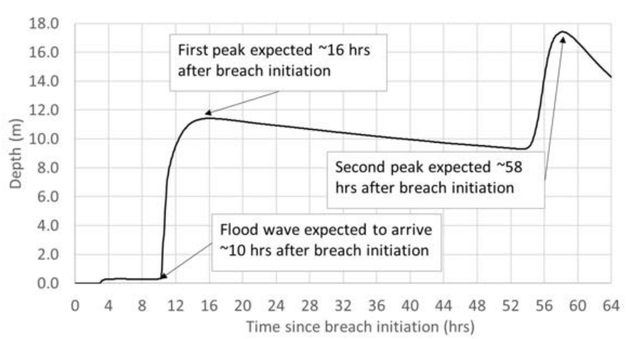


Glen Huon



Huonville

Franklin

Port Huon

GENERAL

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EXPLANATION OF TERMS

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Huon River Dambreak Inundation Mapping

Edgar & Scotts Peak Dam - Earthquake Failure Advancing Hydrographs

Sheet 1 of 1

Revision: 0
Date Produced: June 2021
Plan Reference: P507315_GIS01

Prepared by: Alice Hines
Approved by: Craig Ludlow
Datum: GDA94, Projection: MGA Zone 55

Prepared For :

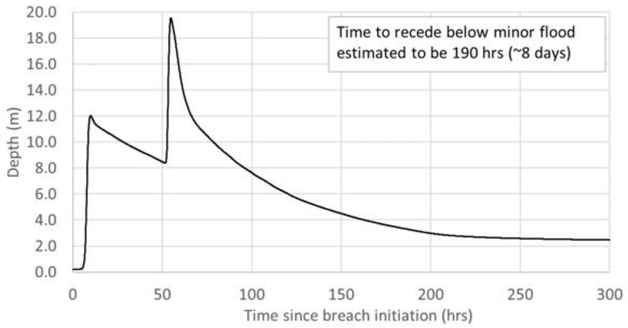
Hydro Tasmania
The power of natural thinking

Prepared By :

entura Hydro Tasmania | The power of natural thinking

Hydraulic modelling undertaken by Civil Team and spatial mapping compiled and presented by Water & Environment Team.

Tahune



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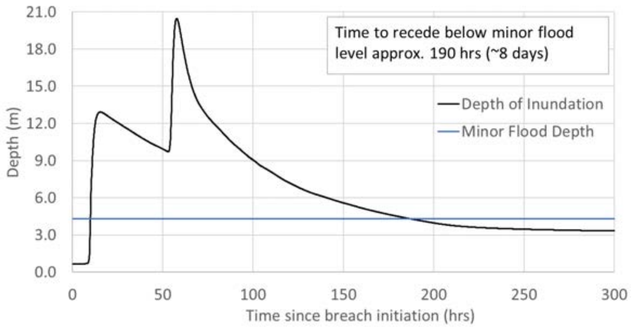
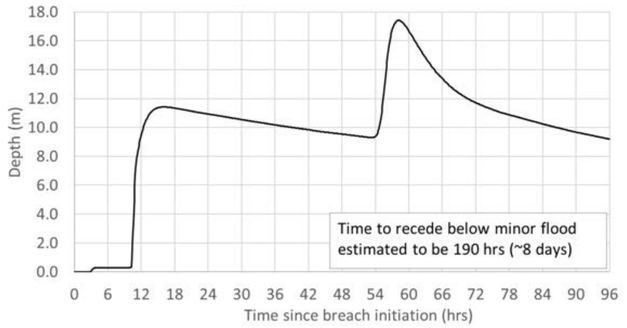


Glen Huon



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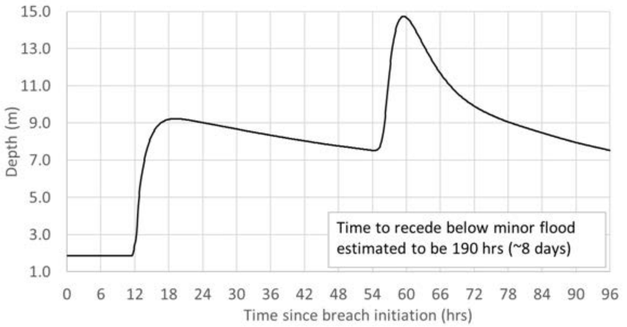

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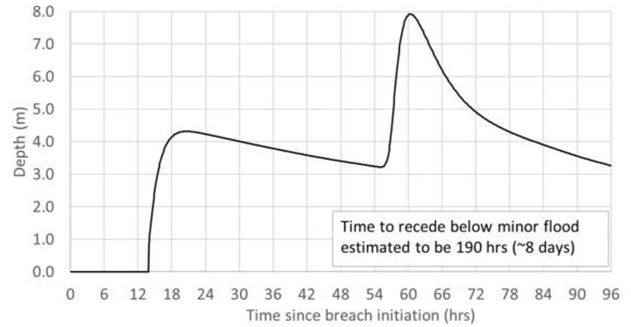
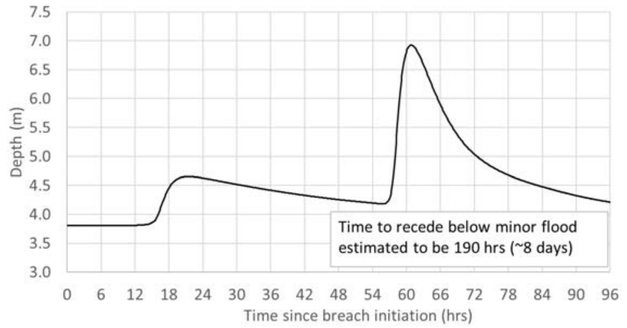


Port Huon



Huon River Dambreak Inundation Mapping

Edgar & Scotts Peak Dam - Earthquake Failure Retreating Hydrographs

Sheet 1 of 1

Revision: 0
Date Produced: June 2021
Plan Reference: P507315_GIS01

Prepared by: Alice Hines
Approved by: Craig Ludlow
Datum: GDA94, Projection: MGA Zone 55

GENERAL

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This map depicts retreating hydrographs at key populated areas on the Huon River that are subject to inundation by flood from an upstream dambreak of Edgar and Scotts Peak Dam resulting from a major earthquake event.

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- Side slopes: 1 vertical : 3.8 horizontal
- Breach time: 1.0 hours

Downstream boundary water level: 0.062 mAHD (mean sea level at Hobart)
MIKE 21 model (two-dimensional): 16 m square
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- Hydraulic models and results stored by Entura (reference E303693-P507315).

EXPLANATION OF TERMS

Chainage:
- The distance in metres from Scotts Peak Dam to that location along the Huon River.

Earthquake failure:
- Dam commences failing after major earthquake event during sunny day conditions (no rainfall, very low inflows)
- Lake Pedder is at FSL (Full Supply Level) at the time of dam failure.

Prepared For :

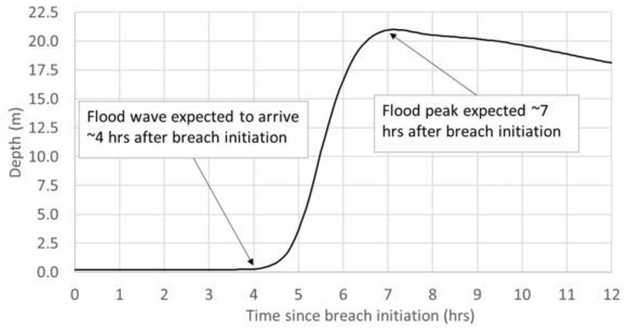
Hydro Tasmania
The power of natural thinking

Prepared By :

entura Hydro Tasmania | The power of natural thinking

Hydraulic modelling undertaken by Civil Team and spatial mapping compiled and presented by Water & Environment Team.

Tahune



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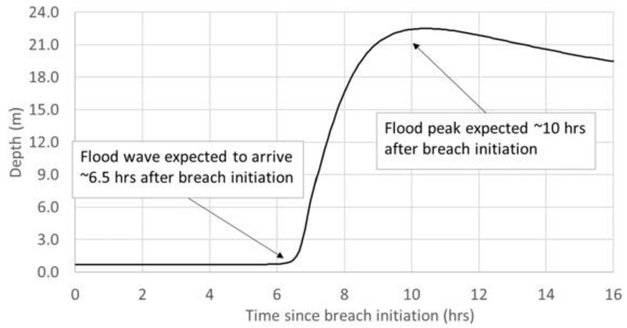

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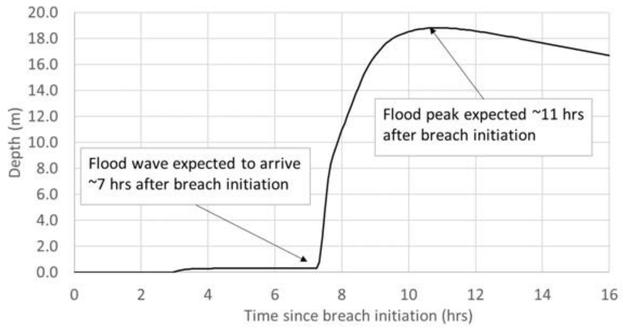

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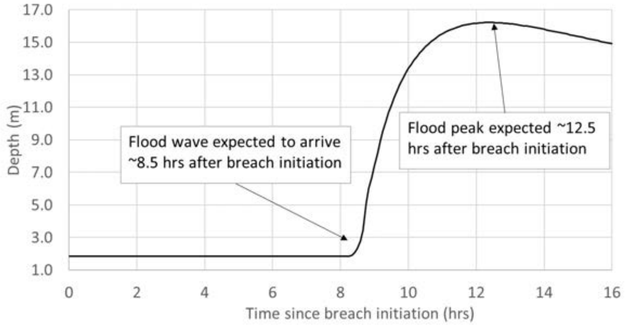

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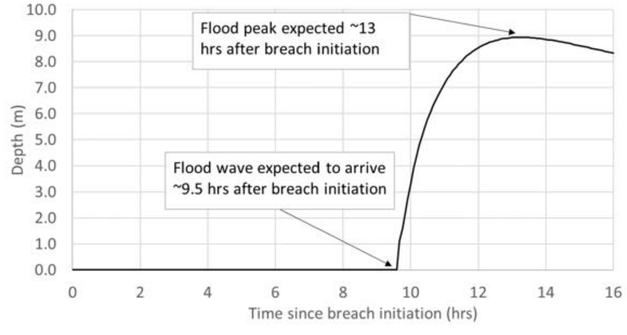

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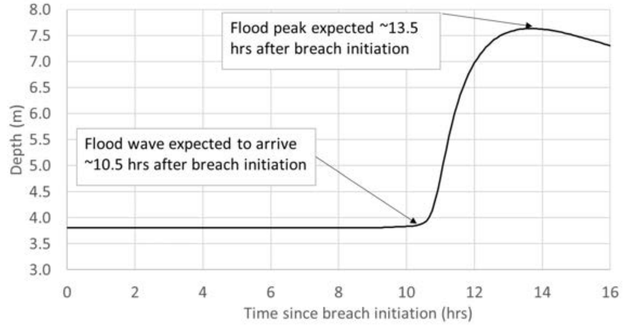

Huon River Dambreak Inundation Mapping

Scotts Peak Dam - Earthquake Failure Advancing Hydrographs

Sheet 1 of 1

Revision: 0
Date Produced: June 2021
Plan Reference: P507315_GIS01

Prepared by: Alice Hines
Approved by: Craig Ludlow
Datum: GDA94, Projection: MGA Zone 55

GENERAL

This map is to be read in conjunction with the Scotts Peak Dam and Edgar Dam Earthquake Loading Consequence Assessment report (Entura – 6DAA6, May 2014).

This map depicts advancing hydrographs at key populated areas on the Huon River that are subject to inundation by flood from an upstream dambreak of Scotts PeakDam resulting from a major earthquake event.

Inundation depths depicted in hydrographs are indicative only and based on depths in the river channel, not the overbank areas. Refer to inundation maps for peak flood depths at locations of interest.

The estimates of the flood levels may change with future analysis as a result of changed dam breach parameters (i.e. breach width, side slopes and breach time), changes in assumed inflows along the river, river geomorphology, smaller grid size in the two dimensional area modelled, changes in the assumed downstream boundary water level (i.e. tide level) or due to modelling software and techniques.

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(mean sea level at Hobart)
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Lake Pedder level: initial level at Full Supply Level 308.46 mAHD

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Earthquake failure:
- Dam commences failing after major earthquake event during sunny day conditions (no rainfall, very low inflows)
- Lake Pedder is at FSL (Full Supply Level) at the time of dam failure.

Prepared For :

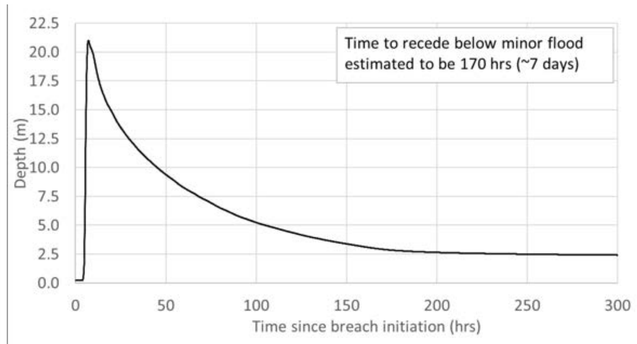
Hydro Tasmania
The power of natural thinking

Prepared By :

entura Hydro Tasmania | The power of natural thinking

Hydraulic modelling undertaken by Civil Team and spatial mapping compiled and presented by Water & Environment Team.

Tahune



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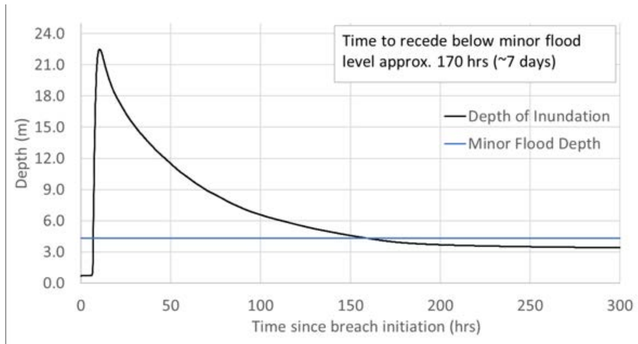

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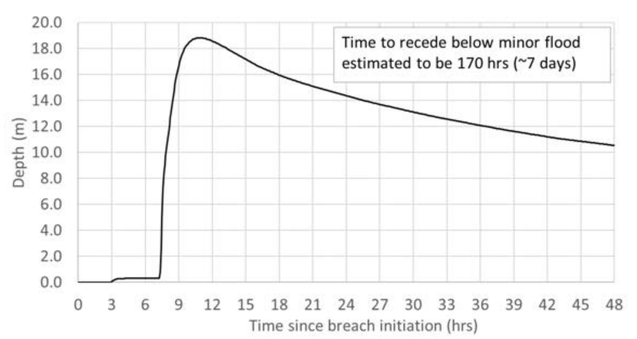

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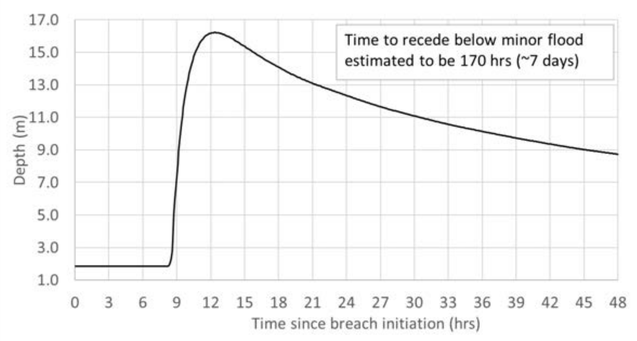

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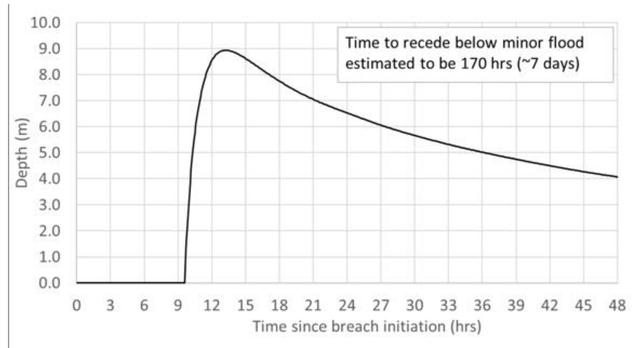

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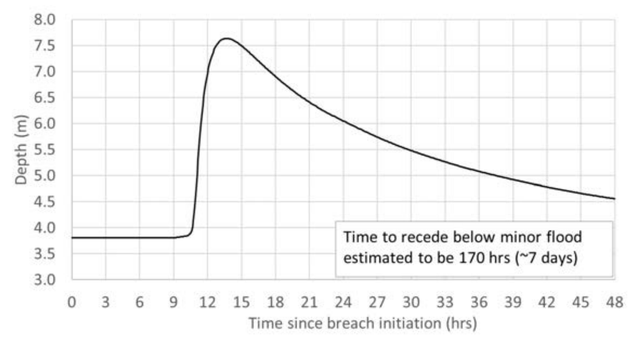

GENERAL

This map is to be read in conjunction with the Scotts Peak Dam and Edgar Dam Earthquake Loading Consequence Assessment report (Entura – 6DAA6, May 2014).

This map depicts retreating hydrographs at key populated areas on the Huon River that are subject to inundation by flood from an upstream dambreak of Scotts Peak Dam resulting from a major earthquake event.

Inundation depths depicted in hydrographs are indicative only and based on depths in the river channel, not the overbank areas. Refer to inundation maps for peak flood depths at locations of interest.

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Huon River Dambreak Inundation Mapping

Scotts Peak Dam - Earthquake Failure Retreating Hydrographs

Sheet 1 of 1

Revision: 0
Date Produced: June 2021
Plan Reference: P507315_GIS01

Prepared by: Alice Hines
Approved by: Craig Ludlow
Datum: GDA94, Projection: MGA Zone 55

Prepared For :

Hydro Tasmania
The power of natural thinking

Prepared By :

entura Hydro Tasmania | The power of natural thinking

Hydraulic modelling undertaken by Civil Team and spatial mapping compiled and presented by Water & Environment Team.

entura Hydro Tasmania | The power of natural thinking

HUON RIVER
Flood Evacuation Plan

1 August 2016

Prepared by Hydro-Electric Corporation
ABN48 072 377 158

t/a Entura 89 Cambridge Park Drive,
Cambridge TAS 7170 Australia

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Entura in Australia is certified to the latest version of ISO9001, ISO14001, and OHSAS18001.

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Huon River Flood Evacuation Plan - Quick Reference Guide

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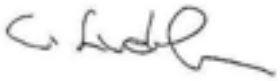
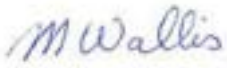
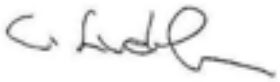
Document information

Document title	Huon River
	Flood Evacuation Plan
Client organisation	Huon Valley Council
Client contact	Huon Valley Council Municipal Emergency Coordinator
ConsultDM number	ENTURA-B90B9
Project Manager	Craig Ludlow
Project number	E304700 - P510490

Revision history

Revision 3.0

Revision description	Final issue		
Prepared by	Craig Ludlow		1 August 2016
Reviewed by	Michael Wallis		1 August 2016
Approved by	Craig Ludlow		1 August 2016
	(name)	(signature)	(date)
Distributed to	Huon Valley Council Municipal Emergency Coordinator (name)	Huon Valley Council (organisation)	1 August 2016 (date)

<u>This page does not form part of the FEP</u>

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Contents

Appendices

List of figures

List of tables

1. Introduction

The Huon Valley experiences natural flooding resulting in the inundation of residences and businesses as well as disruptions to services. The management of flooding whether flash flooding or river flooding is difficult and it is not possible to control all situations. It is imperative that at all times personnel involved in the operation remember not to place themselves or other personnel in situations of risk.

The first priority in a flood event shall always be the protection of life and therefore property damage may result which whilst not desirable may be inevitable. Other management issues include:

- Communications.
- Electricity.
- Water supply. : Geeveston, Grove and Crabtree can experience periods without reticulated water.
- Sewerage - The Ranelagh lagoon and the Geeveston Waste Water Treatment Plant are subject to inundation.
- Roads - The Huon Valley is subject to many roads being flooded and impassable.
- Event Management.

The impact of natural floods on communities can be greatly reduced if the communities have recognised the risk beforehand and put in place emergency plans and other appropriate mitigating measures.

The Huon River Flood Evacuation Plan (FEP) describes a process and provides supporting information for the evacuation of the population at risk near Tahune Airwalk and along the Huon River downstream of Judbury to Port Huon due to natural floods in the Huon River.

The Huon River Flood Evacuation Plan fulfils the requirement for a Special Emergency Management Plan under section 35 of the *Emergency Management Act 2006* and is consistent with the Australian Emergency Management Handbook Series Handbook 4, *Evacuation Planning 2013.*

This document is to be read in conjunction with the:

- Current version of the *Huon Valley Emergency Management Plan* (Issue 6, 2015 at the time of preparing this Plan).
- Current Version of *Flash Flooding & River Flooding Standard Operating Procedures* (Issue August 2014 to be updated by Huon Valley Council).
- Animal evacuation Standard Operating Procedures (under preparation).

Note: It is to be remembered that not every situation that may arise can be covered in this document. Therefore personnel involved must at all times remain flexible in their approach to flood management.

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2. User information

2.1 Purpose of the FEP

The Huon River Flood Evacuation Plan (FEP) describes a process and provides supporting information for the population at risk due to natural and rare dambreak floods in the Huon River.

The current version of FEP is dated August 2016.

The objectives of the FEP are to:

- Describe the various roles and responsibilities of various agencies with respect the various stages of the flood evacuation process.
- Provide a description of the flooding threat from the Huon River and for dambreak scenarios showing the community and infrastructure at risk of flooding, and the consequences from flooding through flood inundation maps and tabulated flood data.
- Document the flood monitoring, warning and notification process.
- Describe the strategies and procedures for evacuating the population.
- Describe the flood response management.
- Describe potential public awareness strategies for flood risks in the Huon River area.

The FEP applies to all occupied residences, roads and bridges at risk along the Huon River that may be subject to inundation from the following flood conditions:

- Natural floods equivalent to 6m, 7m and 8m peak flood levels at the Judbury gauge site.
- Dambreak flood from Scotts Peak Dam for dam crest flood with dambreak.
- Dambreak flood from Edgar Dam, Scotts Peak Dam and the East Saddle Dams for sunny day failure.

The FEP does not cover:

- Flooding due to storm surge.
- Flash flooding on tributaries to the Huon River. Refer to *Flash Flooding and River Flooding, Standard Operating Procedures, August 2014* (HVC).
- Managed return of evacuees.

2.2 Background

The Huon catchment area encompasses 3,800 km^2 of land. The major rivers draining this catchment are the Huon River (104 km), the Picton River (52 km), the Weld River (44 km), the Denison River (30 km) and the Mountain River (24 km), all of which flow into the Huon River Estuary. Further to the

south, a number of smaller rivers (Esperance, Lune, D'Entrecasteaux and Catamaran) flow into coastal estuaries at the southern end of the D'Entrecasteaux Channel.[1]

A substantial portion of the western side of this catchment lies within the Tasmanian Wilderness World Heritage Area (WHA), and is protected from major land use activities. Heading eastward from the WHA boundary, land use progressively moves from native forest harvesting, to cattle and sheep grazing and more intensive agricultural enterprises such as pear, apple and cherry production, small vineyards and specialised hobby farming.[2]

The upper section of the Huon River was modified with the construction of the Scotts Peak Dam which was completed in 1972. The dam impounds Lake Pedder with two other dams, Edgar Dam and Serpentine Dam. Studies by Hydro Tasmania have found that construction of the dam would have little impact on the reduction in peak flood discharge in the Huon River due to the relatively small catchment area upstream of Scotts Peak Dam.

2.3 Preparation of the FEP

This FEP has been prepared by Entura in conjunction with Hydro Tasmania, the Huon Valley Council's emergency management coordinator and the State Emergency Service (SES) southern region manager. Both the Huon Valley Council and SES are represented on the Huon Valley Council Emergency Management Committee (HVCEMC) which also includes representatives from, Tasmania Police, Hydro Tasmania (HT), Tasmanian Water, Parks & Wildlife Services (P&WS), Tasmanian Fire Service (TFS) and Tasmanian Health Organisation South. During the development of the FEP Entura met with the HVC and SES and additional communications were made by phone and email when and where required.

2.4 Geographical scope of the FEP

The FEP covers the area at risk of flooding from the Tahune Airwalk to Port Huon (for natural flooding) and to Eggs and Bacon Bay (dambreak events), where the Huon River becomes a large, wide estuary and flood flows have little influence on the water levels. The geographical extent of the FEP is shown in Figure 2.1.

Tributaries of the Huon River are not covered by this FEP (e.g. Mountain River and Kermandie River). Please refer to the Flash Flooding & River Flooding Standard Operating Procedure (Issue August 2014 – to be updated by HVC) for the procedures to be followed for tributary flooding.

The flood inundation maps prepared as part of this FEP are provided in Appendix D.

[1] Waterways monitoring report, 2005. http://dpipwe.tas.gov.au/Documents/Huon_Report-.pdf

[2] Waterways monitoring report, 2005. http://dpipwe.tas.gov.au/Documents/Huon_Report-.pdf

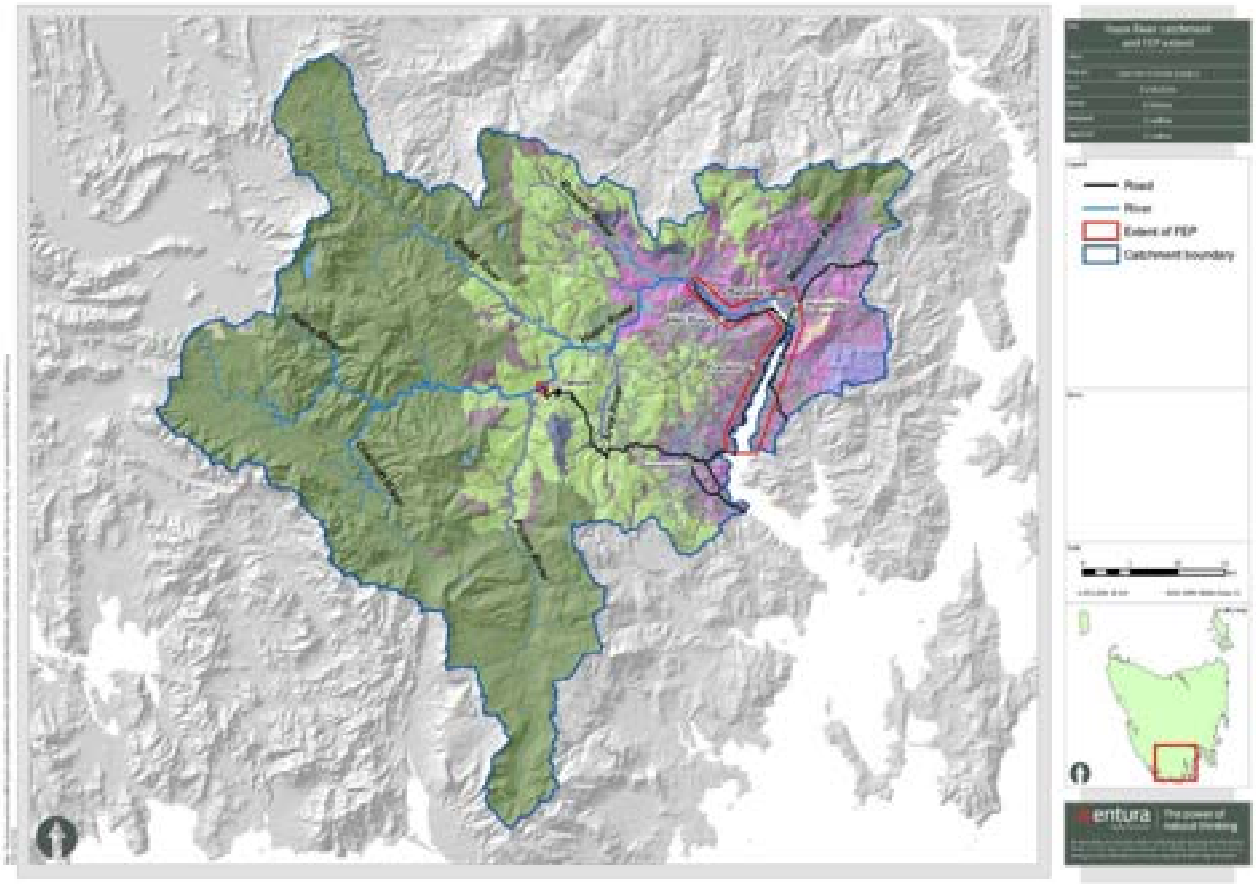

Figure 2.1: Huon River Catchment and extent of the FEP

2.5 Technical basis of the FEP

The flood inundation maps and Flood Reports that form the basis of this FEP were developed using computer hydrologic and hydraulic models.

The natural flooding inundation maps and Flood Reports are based on modelling carried out by Entura in 2016 using the XP SWMM software.

The Sunny Day dambreak Flood Reports are based on modelling carried out by Entura in 2015 using MIKE 21 software.

The dam crest flood dambreak Flood Reports are based on using the same modelling information used to prepare to 2007 FEP (ie this scenario has not been updated) taking into account of buildings that have been constructed since that time.

Details of the recent MIKE 21 (Entura 2015) and XP SWMM (Entura 2016) modelling carried out, and the information upon which the modelling was based, are provided in Appendix G.

2.6 Floor level survey

A floor level survey was conducted in June 2016 by Entura to cover buildings constructed since to the last FEP update (2007). Floor levels of buildings that were thought to be at risk of flooding during extreme flood events were surveyed using precise surveying instruments.

New buildings constructed after issue of this FEP (June 2016) that are at risk of flooding should be surveyed as part of the next FEP update.

2.7 Tides and storm surge

Tides and storm surge can have an impact on the flood level experienced at locations along the Huon River, from Huonville and further downstream. A summary of tidal plane and storm surge levels for Port Huon is provided in Table 2.1. The tidal plane levels were generated by the BoM based on data recorded between 26 May-1987 to 23 August 1988. The storm surge levels were sourced from the LISTmap (Layer: DPAC Projected Sea Level Rise Ref Grid V2). Background information on the estimation of the storm surge levels can be found on the Department of Premier and Cabinet (DPAC) website.
http://www.dpac.tas.gov.au/divisions/climatechange/climate_change_in_tasmania/impacts_of_climate_change/coastal_impacts

Table 2.1: Port Huon tidal planes and storm surge levels

Tidal plane	Level (m Port Datum)	Level (m Huon Bridge gauge)	Level (m AHD)
HAT	1.52	2.21	0.77
MHHW	1.33	2.02	0.58
MLHW	0.98	1.67	0.23
MSL	0.79	1.48	0.04
AHD	0.75	1.44	0.00
MHLW	0.59	1.28	-0.16
MLLW	0.25	0.94	-0.50
LAT	0.00	0.69	-0.75
Storm surge event	**Level (m Port Datum)**	**Level (m Huon Bridge gauge)**	**Level (m AHD)**
0.5% AEP	0.66	2.85	1.41
1% AEP	0.62	2.81	1.37
2% AEP	0.58	2.77	1.33
5% AEP	0.51	2.70	1.26

Based on tidal plane information for Port Huon the difference between highest astronomic tide (HAT) and lowest astronomical tide (LAT) is 1.52m (Entura, 2016). Tidal amplitude (ie. the elevation of tidal high water above mean sea level) for HAT is 0.77m.

The coincidence of a high tide, or storm surge, may act to exacerbate the flood levels along the Huon River during a flood event.

An assessment of tidal influence on peak water levels was carried out using the XPSWMM hydraulic model (Refer to G) for the 7m gauge level flood at Judbury. Based on the modelling:

- The difference in water levels in Huonville was modelled to be around 20cm between LAT and HAT events. However from the August 2007 calibration event the XP SWMM model appears to underestimate the effects of tidal influence of water levels at Huonville (by overestimating the flood levels at lower tides) and the difference in peak flood levels between lower and higher tides may be greater than predicted by the current model.
- Tidal influence on flood levels is limited to the river reach downstream of approximately Ranelagh.

In the event of a flood event, predicted tide levels and timings at Port Huon can be found on the BoM website. http://www.bom.gov.au/australia/tides/#!/tas-port-huon

During a flood event HVC and SES should enquire with the BoM for tidal information so it can be taken into account when planning evacuations.

2.8 Tributary effects

Flooding within tributaries is not covered in this FEP. Flooding along the Huon River has been modelled so that the catchment areas of all contributing tributaries have been taken into account.

2.9 Responsibilities

The Huon Valley Council, in conjunction with the Tasmania Police/SES, have a duty to inform the population most at risk from flooding, so that they are aware of the threat to themselves and their properties, and understand what actions they may need to take to protect themselves. This includes knowing at what stage their property may be inundated, the appropriate evacuation routes and when these may become impassable, and the location of evacuation centres (Ref. *Huon Valley Emergency Management Plan, 2015*).

Other agencies that have responsibilities during the course of a natural and dambreak flood events include:

- State Emergency Service (SES), lead agency for natural floods.
- Tasmania Police, lead agency for dambreak floods.
- Huon Valley Council (HVC).
- Hydro Tasmania (HT).
- Bureau of Meteorology (BoM).
- Department of Health and Human Services (DHHS), Tasmanian Health Service Southern Region.
- Department of State Growth.
- Department of Primary Industries, Parks, Water and Environment (DPIPWE).
- TasWater.

Each of the above organisations will play a vital role in a flood evacuation process. Please note that the order listed is not hierarchical in level of responsibility.

Tasmania Police is the lead agency for dambreak flood events with the SES taking a lead role for natural flood events.

State Emergency Service (SES) is responsible for:

- Regional emergency management coordination.
- Maintaining the regional emergency operation centre in Skinner Drive, Huonville.
- Assisting Tasmania Police in evacuations and road closures.
- Co-operation with local government with respect to flood hazard analysis, floodplain mapping, property floor height studies and provision of advice to local government on response to flood emergencies.
- Ensuring natural flood event flood warnings are provided to the general public and local government in co-operation with the **Bureau of Meteorology** and **Tasmania Police**.

- Co-ordination of the collection, interpretation and dissemination of flood intelligence during a natural flood event.
- Provision of assistance and co-ordinate additional resources to local government and other agencies during a natural flood event.
- Co-ordination of the provision of Commonwealth support in the event of a major natural flood.
- Co-ordination flood damage assessments from natural flooding.
- Ensuring multi-organisational debriefs are conducted following flood response operations.

Tasmania Police is responsible for:

- Safety of people and property.
- Managing evacuations and road closures with the assistance of other organisations.
- Issuing public warnings and media liaison.
- Road closures.
- Evacuation of persons likely to be in danger and co-ordinate other organisations involved.
- Rescue of persons in danger.
- Securing evacuated areas.
- Control of traffic and provision of advice to the public on hazards, closure of roads, bridges etc.
- Co-operation with other organisations in arranging shelter and relief for flood victims.
- Search for missing persons or bodies.
- Collection of detailed flood damage information.

Huon Valley Council (HVC) represents the community at risk and is responsible for:

- Emergency management within the Council area.
- Maintaining emergency operation centres.
- Assisting **Tasmania Police/SES** in evacuations and road closures.
- Assisting the **Department of Health and Human Services** in providing for the welfare of evacuated and other affected people.
- Ensuring flood planning documentation is kept up to date.

A flood event, be it localised flash flooding or a river flood, occurring within the municipal area requires a coordinated response by the Council.

The coordination of Council's response shall be the responsibility of the Municipal Coordinator Emergency Management who shall liaise directly with the General Manager.

A meeting of the Municipal Emergency Management Committee may be convened to provide advice/assistance during a flood event if deemed necessary.

Hydro Tasmania is responsible for:

- Providing information to Tasmania Police/SES on historic high levels and forecast extreme flood levels predicted by the HT Flood Warning System for Lake Pedder.

- Alerting the Tasmania Police/SES of any abnormalities with any of its dams that could develop to failure. Please note that Hydro Tasmania will not be issue public warnings.

The BoM is responsible for:

- Forecasting rainfall and flows on the Huon River catchment.
- Maintaining and operating Huon Valley Flood Warning System.
- Issuing flood watches, river alerts, rainfall alerts and flood warnings.
- Updating HVC and SES if flood warning levels at the Judbury gauge site change.

Department of Health and Human Services (DHHS) is responsible for assisting HVC in:

- Establishing evacuation centres.
- Provision of the welfare of evacuees and other affected people.

Department of State Growth is responsible for:

- Monitoring roads and bridges.
- Removal of obstructions to waterways at culverts and bridges caused by floating debris.
- Road closure and traffic diversion planning.

Department of Primary Industries, Parks, Water and Environment (DPIPWE) is responsible for:

- Maintaining and regularly gauging the Judbury and Huonville gauge sites upon which the BoM flood warnings are based.
- Updating the HVC and SES if there are any changes to the Judbury gauge site rating curve.

TasWater is responsible for:

- Monitoring infrastructure during floods.
- Notifying the Environmental Protection Agency (EPA) in the event of spill or contamination.

2.10 Contact details

The contact details of the relevant organisations in a natural flood emergency are shown in Table 2.2.

Table 2.2: Contact details of responsible organisations

Organisation	Emergency contact details	Administrative contact details
Bureau of Meteorology	(03) 6221 2000	111 Macquarie Street, Hobart 7001 (03) 6221 2000 (24hr number)
Huon Valley Council	(03) 6264 0300 All hours	40 Main Street ,Huonville, 7109 (03) 6264 0300 hvc@huonvalley.tas.gov.au
State Emergency Services (The Southern Region Headquarters)	132500 (Flood & Storm Emergency)	Level 1, 28 Bathurst Street, Hobart (03) 6173 2707 ses@ses.tas.gov.au
State Emergency Services (Huon Valley Unit)	6173 2700	Skinner Drive Huonville, 7109
Tasmania Police (Huonville)	000 131 444 (Non-emergency Police Assistance Line)	10 Sale Street, Huonville,7109 (03) 6264 8700
Tasmanian Health Service - Southern Region	South Regional Recovery Coordinator 0438304565	GPO Box 125, Hobart 7001
Marine and Safety Tasmania (MAST)	62252721	GPO Box 607, Hobart 7001 (03) 6235 8888 (Business hours only)
Department of State Growth	Emergencies – Roads & Bridges 1800 005 282 (24hr)	GPO BOX 536, Hobart, 7001 1800 030 688 (General Enquiries)
Tas Water	13 69 92	GPO Box 1393 Hobart Tas 7001 13 6992
Aurora	13 2004	GPO Box 191 Hobart TAS, 7001
Hydro Tasmania	1300 360 441 (Business hours) (03) 6305 5569 (Out of hours only)	4 Elizabeth Street, Hobart 7000 1300 360 441 contactus@hydro.com.au

2.11 Related documents

This FEP forms a part of an overall set of emergency management plans that are deployed by Tasmania Police, SES, Huon Valley Council, Hydro Tasmania, and BoM in the event of serious flooding to aid the community in the Huon River area.

Other flood emergency plans include:

- Hydro Tasmania Dam Safety Emergency Plan, November 2015 (Dam Safety Team, Assets & Infrastructure team, Hydro Tasmania), and subsequent updates.

Reference may also be made to:

- Animal Evacuation Standard Operating Procedures (under development)
- Tasmanian Emergency Management Plan (Issue 8), October 2015 (SES).
- Huon Valley Emergency Management Plan (Issue 6, 2015 at the time of preparing this Plan).
- Flash Flooding & River Flooding Standard Operating Procedures (Issue August 2014 to be updated by Huon Valley Council).

2.12 Glossary

AEP	Annual exceedance probability - "A measure of the likelihood (expressed as a probability) of a flood reaching or exceeding a particular magnitude. A 1% (AEP) flood has a 1% (or 1:100) chance of occurring or being exceeded at a location in any year."
	Bureau of Meteorology.
Consequence	The effects of an action or event. In the case of a flood event, these may include adverse effects to life, health, property, the environment or business concerns.
DCF + DB	Dam crest flood with dambreak. A dam crest flood is a theoretical flood where the water level in the reservoir reaches the dam crest at the peak of the flood. The dam is simulated to fail at the point in time when the reservoir water level reaches the dam crest level.
Datum	A standard position or level that measurements are taken from.
DHHS	Department of Health and Human Services.
DIER	Department of Infrastructure, Energy and Resources.
DPIPWE	Department of Primary Industries, Parks, Water and Environment.
FEP	Flood Evacuation Plan.
HAT	Highest astronomical tide. The highest levels which can be predicted to occur under average meteorological conditions and any combination of astronomical conditions. The HAT will not be reached every year and is not the extreme level which can be reached, as storm surges may cause considerably higher levels to occur.
Hazard	The threat or condition which may result from an external cause (e.g. flood, earthquake) with the potential for creating adverse consequences.
HVC	Huon Valley Council.

HVMEMC	Huon Valley Municipal Emergency Management Committee.
HVEMP	Huon Valley Emergency Management Plan.
LAT	Lowest astronomical tide. The lowest levels which can be predicted to occur under average meteorological conditions and any combination of astronomical conditions. The LAT will not be reached every year and is not the extreme level which can be reached, as high pressure systems may cause considerably lower levels to occur.
MAST	Marine and Safety Tasmania.
MSL	The mean level of the sea over a long period (preferably 18.6 years) or the mean level which would exist in the absence of tides.
m gauge	Level of water in relation to a site specific datum. For example, at a river gauge site the datum (zero level), could be set as being the invert of the river.
m AHD	Level of water in relation to the Australian Height Datum (AHD). The AHD is a geodetic datum for altitude measurement in Australia and 0m AHD is roughly equivalent to MSL.
m^3/s	A unit of measurement equal to one cubic metre (1 m^3 = 1000 L) per second, used as a flow rate, or discharge rate, of water in rivers and creeks.
Port datum	The datum to which marine charts and tide levels from the BoM are related to. Port datum is roughly equivalent to the LAT at a particular location. Therefore the relationship between LAT and AHD is not consistent along the coastline.
Risk	A measure of the probability and severity of an adverse effect to life, health, property, the environment or business concerns.
SDF	Sunny day failure.
SES	State Emergency Service.
Tidal planes	Statistical definitions of tide levels (eg LAT, MSL, HAT).

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3. Huon River flood warnings

3.1 Natural flood warning

3.1.1 Introduction

The Huon Valley Council identified flooding as a significant risk within the municipal area. It was recognised that major flooding is almost certain, and while the likelihood cannot be reduced, the communities' vulnerability could.

With that in mind a submission for an improved flood warning network system throughout the Huon basin was made in partnership with the Bureau of Meteorology (BOM). The submission successfully attracted Regional Flood Mitigation Program funding to create the Huon Valley Flood Warning System (HVFWS).

The Huon Flood Warning system consists of a network of 12 rainfall and river height monitoring stations, enabling detailed monitoring of rainfall and river height conditions in the basin and advanced warnings of impending floods. Field sites in the HVFWS are shown in Table 3.1.

This network of event-reporting telemetry stations (ERTS), is closely monitored by BoM and information is used to issue flood watches and flood warnings. Flood information is obtainable from the BoM via their website.

http://www.bom.gov.au/tas/flood/southern.shtml

Table 3.1: Huon Valley flood warning system field sites

Area	Service
Huonville Bridge	Field station
Judbury Bridge	Field station
Warra	Field station
Tahune Bridge	Field station
Farmhouse Creek	Field station
North Boomerang	Field station
Fool Ridge	Repeater
Razor Back	Field station
Harrison Opening	Field station
Muller Ridge	Field station
Mt Frederick	Repeater

3.1.2 Flood watches

Flood watches are issued for specific regions (eg Huon River Basin) and advise that a flood is possible in those regions. They are issued by the BoM 24-36 hours in advance of any likely flooding and updated as required.

If there is an imminent threat of a flood occurring, the flood watch will be upgraded to a flood warning.

3.1.3 Flood warning triggers

Flood warnings are firm predictions of flooding issued by BoM based on:

- Actual rainfall measurements.
- Stream flow based models of catchment behaviour.
- Likely future rainfall.

Flood watches and warnings contained on the BoM website provide generic public safety advice. The SES Regional staff will value-add to the warnings and provide a description of possible flood consequences and specific localised public safety advice direct to Council.

Flood warnings issued by the BoM should be used with this document to determine an appropriate response.

The current river flood warnings provided by the BoM are at the Judbury and Huonville gauge sites. Details of these stations and the flood warning levels are provided in Table 3.2.

Table 3.2: Huon River flood warning stations

	Huon River at Judbury	**Huon River at Huonville**
Station number	094179	094180
Name	Huon Rv at Judbury (D)	Huon Rv at Huonville
Owner	DPIPWE	DPIPWE
Minor flood level (m gauge)	4.0	3.0
Moderate flood level (m gauge)	6.0	3.8
Major flood level (m gauge)	7.0	4.2

Note:

- The flood warning levels are to individual site datums.
- Judbury gauge: 0m = +10.91m AHD (Surveyed January 2014)
- Huonville gauge: 0m = -1.438m AHD (Surveyed January 2014

As a general rule levels at the Judbury river gauge site will produce the following:

4.00 metres

Minor flooding of agricultural and horticultural land along the river flats with some potential for stock losses. Closure of the Channel Highway at Huonville (between Main Street and Flood Road).

6.00 metres

Moderate flooding of agricultural and horticultural land along the river flats with potential for stock losses. Damage to fencing and low lying structures. Flooding of low-lying areas of Huonville with the possibility of water damage to some dwellings and commercial properties. Closure of the Channel Highway at Huonville.

In addition the tide can have a significant impact on the impact of flooding and should always be considered in the assessment. Also the level of the Mountain River should be considered as if this river is in flood then this can increase the potential levels within Huonville that may be higher than that assessed based on the Judbury levels as with the impact of the tides.

7.00 metres (plus)

As above, with water levels within the Huonville area increasing within the township. Potential for closure of Wilmot Road in Huonville and the Huon Highway between Huonville and Franklin (dependant on tidal impact).

3.1.4 Basis of flood warning levels

The flood warning levels at Judbury and Huonville are based on the current understanding of flooding that will occur downstream of the gauging site once a certain water level is reached at each site.

It should be noted that the flood warning levels should not be considered as being static and they may need to be reviewed and potentially adjusted over time should the following occur:

- The gauge sites are rebuilt resulting in a change of the site datum.
- The river level versus flow rating curve (Judbury only) at the site is adjusted due to additional flow measurements.

As the owner of the sites DPIPWE should make the BoM, SES and HVC aware of any changes that are made to the Judbury or Huonville Bridge river gauge sites as changes could affect the FEP.

3.1.5 Water level gauges in Huonville

In addition to the river gauge sites there are flood level gauges located within the centre of Huonville at the following locations:

- Huon River - Channel Highway side of bridge at the northern end.
- Council Carpark - Main Street near main sewer pump station.
- Short Street – End of the road.
- Skinner Drive – Near car park area.
- IGA Car Park – Rear bottom corner.

The town gauges can be used as a visual indicator of flood level rise during the flood event, but should not be compared directly with BoM forecast or present levels.

In all cases the flood level readings should be recorded and collated against permanent identifiable points (i.e. buildings).

3.1.6 Issue of flood warnings

Flood warnings will be issued by the Bureau of Meteorology via a number of different means. These are outlined in their *Flood Warning Services Policy* (1999). Information is issued via phone, sms, e-mail, the internet and tv/radio (via ABC radio), with some or all methods employed, depending on the severity of the flood.

The BoM provide current and predicted levels when issuing flood warnings. The type of information issued by the BoM will vary, depending on the catchment or catchments affected, and the anticipated magnitude of the event.

Flood warnings issued by the BoM for the Huon Valley should be used with this FEP to determine a course of action.

3.2 Dambreak flood warning

In 2005, Hydro Tasmania issued its *Dam Safety Emergency Plan* (DSEP), which identifies emergency conditions at its dams, prescribes emergency response procedures for its staff and establishes communication links with the appropriate emergency management agencies. Dam safety emergency plans are considered industry best practice by dam owners, and are a requirement of Tasmanian State Legislation (*Water Management Act 1999*). Hydro Tasmania's DSEP is reviewed annually.

The Dam Safety Emergency Plan is predominantly an internal document, designed to assist Hydro Tasmania's employees with identifying, monitoring, responding to and mitigating dam safety emergencies. Emergency management organisations in each state have a responsibility to ensure planning is in place to deal with flooding[3].

It is important to note that the Huon River Flood Evacuation Plan is separate to the Dam Safety Emergency Plan. The Huon Valley Council owns this FEP document and Hydro Tasmania owns the DSEP. Any updates to information contained within the DSEP (e.g. flood water travel times) will not automatically be transferred across to the FEP.

Under its DSEP, Hydro Tasmania has procedures in place to notify Tasmania Police and the State Emergency Service if it declares a 'Dam Safety Event' or 'Dam Safety Emergency' at one or more of its dams.

If a dam failure occurs, the warning time downstream communities have, will depend on the following:

- Awareness of Hydro Tasmania regarding the integrity of its dams and extreme flood levels within Lake Pedder.
- The travel time of the dambreak flood wave.

Table 3.3 shows the estimate travel times for a range of dambreak scenarios for the flood wave to reach downstream population centres. These can be used in conjunction with event forecasts from Hydro Tasmania to estimate the total time available for warning and evacuation.

[3] Emergency Management Australia. Australian Emergency Manuals Series, Part III., Guide 7 Emergency Management Planning for Floods Affected by Dams. Commonwealth of Australia, 2001:2.

Table 3.3: Estimated flood wave travel time for modelled dambreak events

Location	Time for arrival of flood wave (hr:min) from commencement of dam failure					
	Scotts Peak Dam DCF + DB	**Scotts Peak Dam SDF**	**Edgar Dam SDF**	**Edgar Dam SDF with Scotts Peak Dam SDF 24hrs later**	**Simultaneous SDF of Edgar Dam and Scotts Peak Dam**	**Scotts Peak East Saddle Dam SDF**
Tahune Airwalk		02:40	03:30	2:35	2:35	03:15
Judbury	04:40	05:00	07:00	4:50	4:50	06:20
Glen Huon		06:20	09:20	06:10	06:10	08:30
Huonville	06:35	07:20	10:30	07:10	07:10	09:30
Franklin	07:20	07:45	10:55	07:35	07:35	10:00
Port Huon	08:05	08:15	11:25	08:05	08:05	10:30

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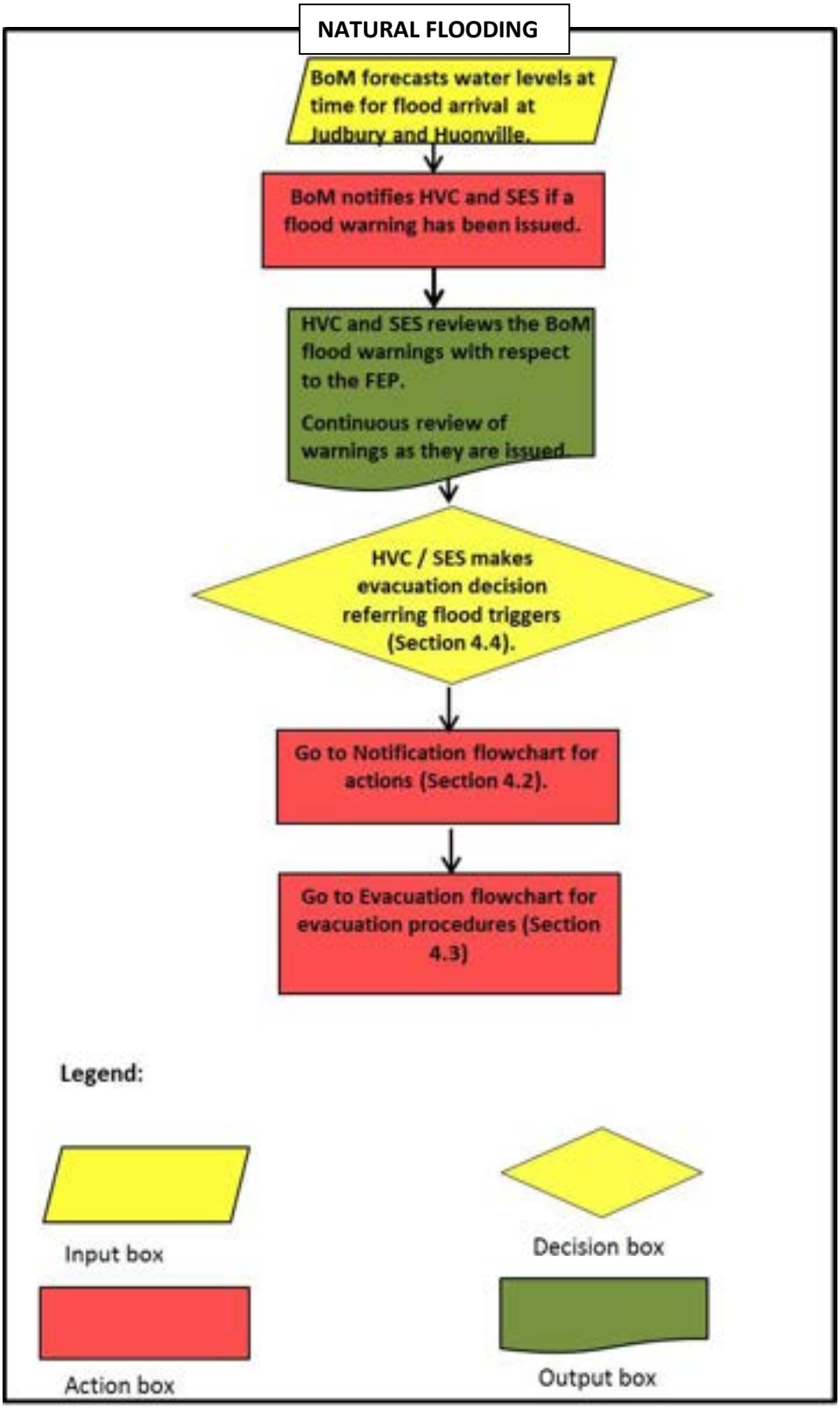
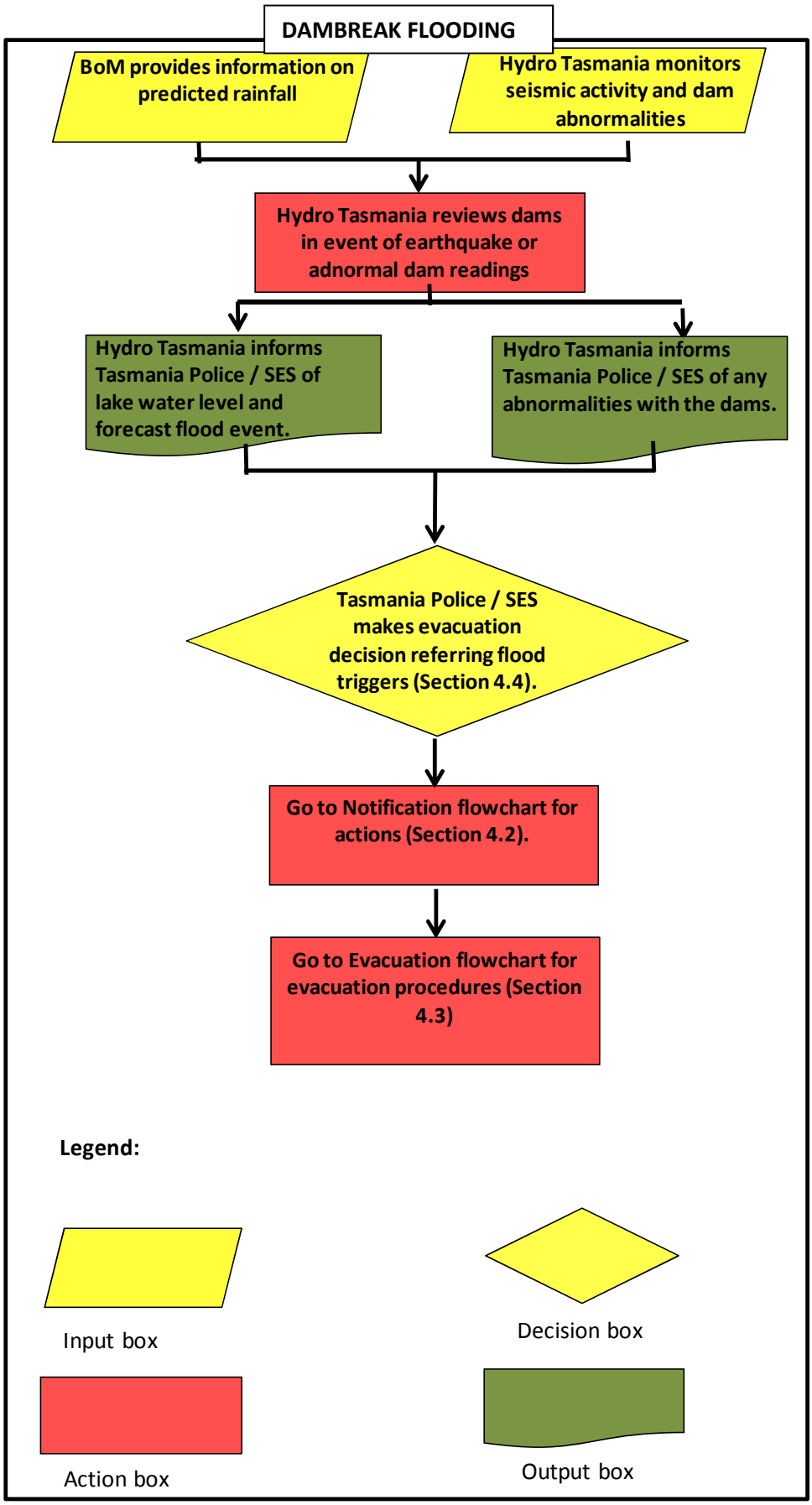
4. Flowcharts

The following flowcharts detail the process and procedure in identifying and responding to a flood event and implementing the evacuation process:

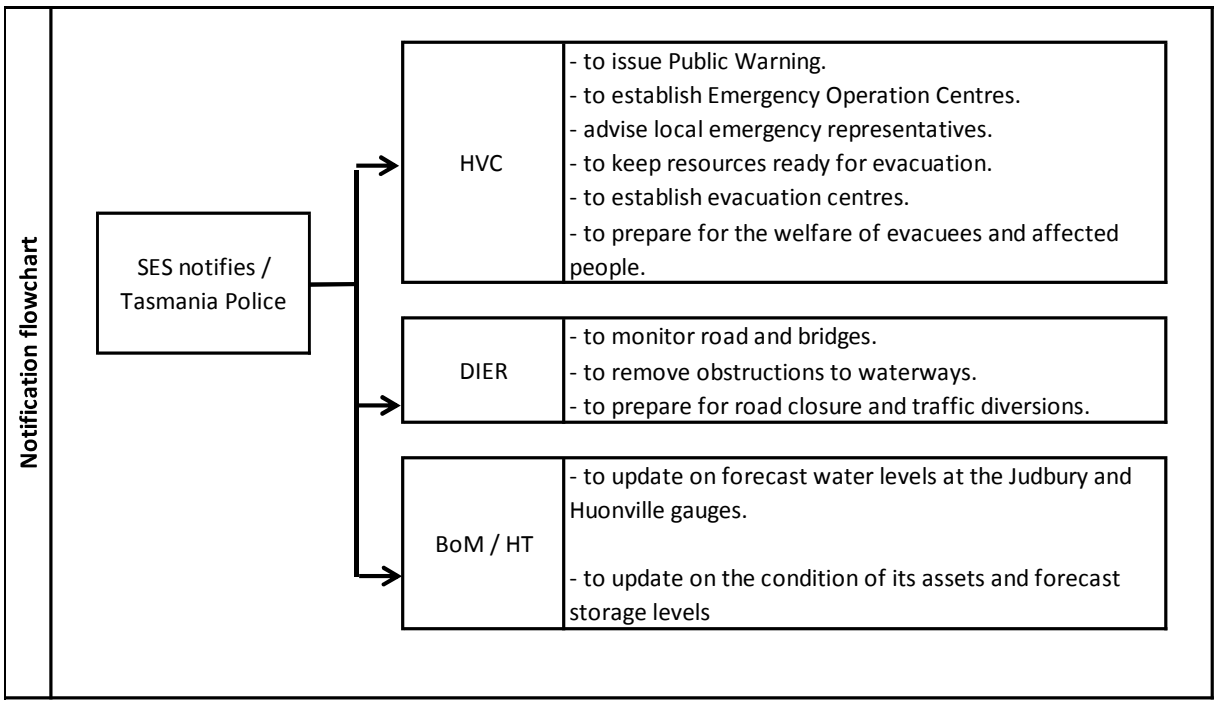
- The decision making flowchart (Section 4.1) enables HVC/SES to decide on the most appropriate evacuation procedure based on BoM's inputs for forecast.
- The notification flowchart (Section 4.2) enables Tasmania Police/SES to notify the respective organisations for various tasks before, during and after the evacuation procedure.
- The evacuation flowcharts (Section 4.3) provide Tasmania Police/SES with an evacuation process to follow for a particular flooding event.

4.1 Decision making flowcharts

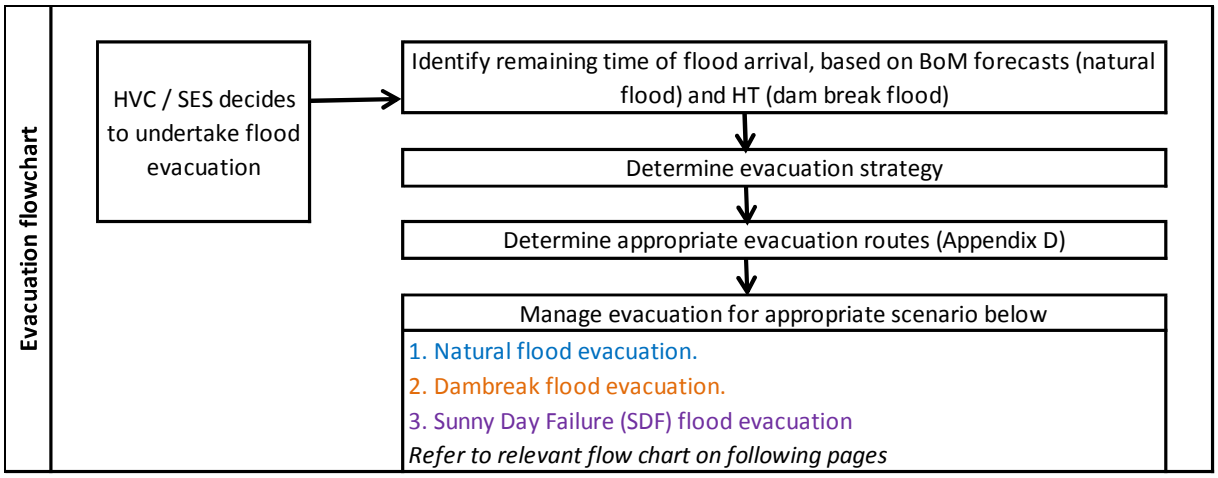



DAMBREAK FLOODING
BoM provides information on predicted rainfall
Hydro Tasmania monitors seismic activity and dam abnormalities
Hydro Tasmania reviews dams in event of earthquake or adnormal dam readings
Hydro Tasmania informs Tasmania Police / SES of lake water level and forecast flood event.
Hydro Tasmania informs Tasmania Police / SES of any abnormalities with the dams.
Tasmania Police / SES makes evacuation decision referring flood triggers (Section 4.4).
Go to Notification flowchart for actions (Section 4.2).
Go to Evacuation flowchart for evacuation procedures (Section 4.3)
Legend:
Input box
Decision box
Action box
Output box

4.2 Notification flowchart



4.3 Evacuation flowchart



4.4 Flood triggers and actions

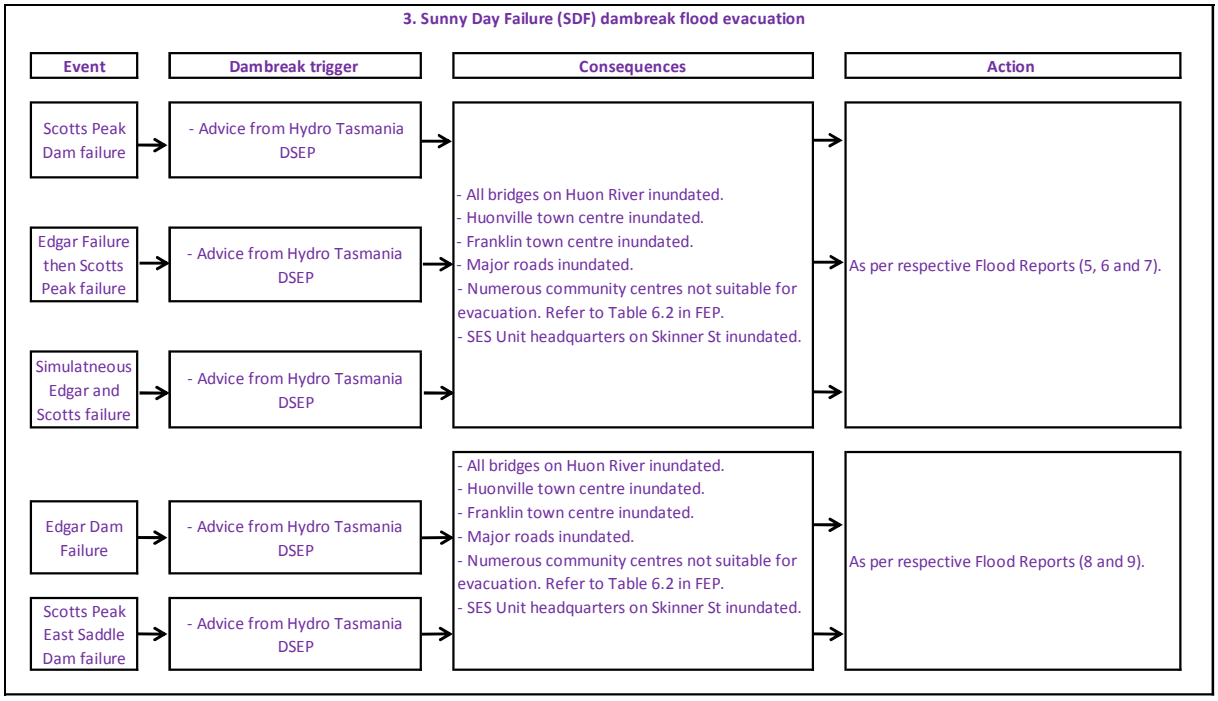
1. Natural flood evacuation

Event	Flood trigger	Consequences	Action
Moderate flood	6m at Judbury 3.8m at Huonville*	- Refer to Flood Report No 1 and Map Set A. - Tahune Bridge overtopped. - Number of roads inundated. - Huonville Town Hall and Franklin Club Rooms not suitable as evacuation centres.	- As per Flood Report No 1 and Map Set A. - Initiate closures for inundated roads/bridges.
Major flood	7m at Judbury 4.2m at Huonville*	- Refer to Flood Report No 2 and Map Set B. - Tahune Bridge overtopped. - Number of roads inundated. - Huonville Town Hall and Franklin Club Rooms not suitable as evacuation centres.	-As per Flood Report No 2 and Map Set B. - Initiate closures for inundated roads/bridges.
Major flood	8m at Judbury > 4.2m at Huonville*	- Refer to Flood Report No 3 and Map Set C. - Tahune Bridge overtopped. - Number of roads inundated. - Huonville Town Hall and Franklin Club Rooms not suitable as evacuation centres.	- As per Flood Report No 3 and Map Set C. - Initiate closures for inundated roads/bridges.

* Water levels at Huonville are influenced by the tide and contributing flow from Mountain River. Huonville water levels are based on

2. Dam crest flood and dambreak flood evacuation

Event	Dambreak trigger	Consequences	Action
Edgar or Scotts Peak DCF + DB	- Edgar and Scotts Peak DCF advice from Hydro Tasmania DSEP	- All bridges on Huon River inundated. - Huonville town centre inundated. - Franklin town centre inundated. - Major roads inundated. - Numerous community centres not suitable for evacuation. Refer to Table 6.2 in FEP. - SES Unit headquarters on Skinner St inundated.	As per Flood Report No 4.



4.5 Flood maps and reports

Flood inundation maps and flood reports have been prepared for the natural and dambreak flood events and are provided in Appendix D and Appendix E respectively.

The flood maps show the following information:

- Inundation extent.
- Buildings both affected and unaffected by the modelled flood extent.
- Flood discharge and flood levels at key locations.
- Flood travel time from Tahune and the Judbury gauge site.
- Areas islanded by flooding.
- Roads and bridges cut by flooding.
- Emergency response functions (based on Flood Preparedness, Manual 20, Appendix D).
- Locations of emergency services and evacuation centres.

The flood reports show the population at risk for a range of magnitude of flood events based on eleven flood zones as defined by the SES: A, B, C, D, E, F, G, H, I, J and K. A map defining the flood zones is provided in Appendix C.

The flood reports provide details on:

- The modelled flood levels.
- Properties affected.
- The property locations by township and grid reference.
- The flood level below or above property floor levels.

- The actions to be taken to protect life and property.
- The flood level below or above roads and bridges.

The flood reports are designed to be a guide for actions to be taken during relevant flood event. The actions are based on the following water levels relative to property floor levels:

- **No action** - water level is more than **0.4 metres below** the floor of the property;
- **Monitor** - water level is between **0.4 metres and 0.1 metres below** the floor of the property;
- **Sandbag** - water level is between **0.1 metres below and 0.3 metres above** the floor of the property; and
- **Evacuate** - water is more than **0.3 metres above** the floor of the property.

The following flood reports have been prepared:

  - Flood Report No 1: 6m flood at Judbury gauge.
  - Flood Report No 2: 7m flood at Judbury gauge.
  - Flood Report No 3: 8m flood at Judbury gauge.
  - Flood Report No 4: Dam crest flood and failure of Scotts Peak Dam.
  - Flood Report No 5: Sunny day failure of Scotts Peak Dam.
  - Flood Report No 6: Sunny day simultaneous failure of Scotts Peak and Edgar Dams.
  - Flood Report No 7: Sunny day failure of Edgar Dam followed by failure of Scotts Peak Dam.
  - Flood Report No 8: Sunny day failure of Scotts Peak East Saddle Dam.
  - Flood Report No 9. Sunny Day failure of Edgar Dam.

4.6 Huonville flood level table

Flood emergency management within Huonville is partly based upon forecast water levels at the gauge downstream of the bridge, however in larger floods there can be a significant water level differential across the bridge with high water levels on the upstream side.

A relationship between the water level downstream (at the Huon Bridge gauge) and upstream of the Huonville Bridge (gauge board) was developed using the XP SWMM model. This relationship can be used to estimate the potential flood levels on the upstream side of the bridge near where flow can overtop Main Street.

The locations within the XP SWMM model from which the relationship was derived are shown in Figure 4.1.

The water level relationship is provided in Table 4.1.

Figure 4.1: Locations in XP SWMM model for deriving water level relationship

Table 4.1: Water level relationship between downstream and upstream of Huonville Bridge

Water levels (m AHD)		**Water levels (m gauge)**	
Downstream of Huon Bridge	Upstream of Huon Bridge	Downstream of Huon Bridge	Upstream of Huon Bridge
For water levels less than 2.38m AHD (3.82m gauge) recorded at the Huon Bridge gauge, the gauge board upstream of the bridge is not likely to be inundated.			
2.38	2.39	3.82	3.83
2.41	2.51	3.85	3.95
2.46	2.71	3.90	4.14
2.51	2.78	3.95	4.22
2.56	2.81	4.00	4.25
2.61	2.87	4.05	4.31
2.66	2.96	4.10	4.40
2.71	3.03	4.15	4.47
2.76	3.10	4.20	4.54
2.81	3.17	4.25	4.60
2.86	3.23	4.30	4.67
2.91	3.30	4.35	4.74
2.96	3.37	4.40	4.80
3.01	3.43	4.45	4.87
3.06	3.50	4.50	4.93
3.11	3.56	4.55	5.00
3.16	3.62	4.60	5.06
3.21	3.68	4.65	5.12
3.26	3.74	4.70	5.18
3.31	3.80	4.75	5.24
3.36	3.85	4.80	5.29
3.41	3.91	4.85	5.35
3.46	3.96	4.90	5.40
3.51	4.02	4.95	5.46
3.54	4.05	4.98	5.49

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5. Flood consequences

5.1 Consequences of flooding

The likely consequences of flooding include:

- Loss of life (less likely consequence for natural floods) due to:
  - being trapped inside dwellings due to rising flood-waters
  - being swept into deep floodwaters whilst trying to cross a bridge or flooded road in a car or by foot
  - falling into a river, stream or stormwater drain (more likely for children than adults)
  - electrocution from fallen electricity lines and shorted electricity circuits
  - attempting to rescue stranded people, animals at risk, or retrieve property
- Potential death of animals, including livestock
- Destruction of houses and property
- Damage to bridges and roads made impassable by flood and debris
- Public health risks associated with the loss or contamination of water supply
- Failure of sewage treatment and disposal systems which may affect public hygiene
- Loss of electricity supply and telephone systems
- Economic losses due to reduction in property values, damage to uninsured property, clean-up costs, and loss of income due to damage or closure of business premises
- Being isolated by flooded exit routes on temporary islands
- Debris, falling limbs of trees
- Time delays in accessing adequate ambulance and medical services
- Inability to contact emergency services through the loss of telephone communications
- Failure of infrastructure.

During a large flood or dam failure event, there would be widespread community disruption. Damage would occur to private dwellings, business premises, community centres, roads and bridges and other property. In addition, vehicular passage on major roads in the vicinity would not be possible. This may result in the isolating of towns and communities or single dwellings.

With currently available hydrological information and hydraulic modelling, it is possible to make reasonable predictions for flood induced dambreaks. These predictions, when combined with dwelling floor height data, have been used to identify the properties likely to be inundated for a range of magnitude of flood events.

Bridges and low-level roads have also been surveyed to determine which evacuation routes may be available, or when evacuations should take place if predictions indicate that these routes will be blocked. Road closures for through traffic may also be necessary.

A summary of population infrastructure at risk of flooding and anticipated consequences of flooding are detailed in the sub-sections below.

5.2 Community and infrastructure at risk of flooding

5.2.1 Flood hazard

As per the Australian Emergency Handbook 7, *Managing the floodplain: Best practice in flood risk management in Australia* (AEM7), flood hazard is the potential loss of life, injury and economic loss caused by future flood events. This handbook also provides a set of general flood hazard vulnerability curves as shown in Figure 5.1. Flood hazard maps can be developed from flood modelling results using the flood hazard vulnerability curves.

Hazard maps have not been prepared for the modelling used to develop the FEP, however they were developed as part of the recent Huon River flood study carried out by Entura, *Floodplain Risk Assessment Process for Tasmania: Huonville Case Study Flood Study Report* (2016). Figure 5.2 shows the flood hazard estimated in the vicinity of Huonville for the 1% AEP flood event. From the map it can be seen that the islanded area in Huonville is cut off from escape along the Huon Highway to the north by category H3 flood hazard. From Figure 5.1 H3 is unsafe for vehicles, the elderly and children.

For this FEP flood hazard has been taken into account in determining evacuation actions for areas that become islanded to take into account of the hazard of escaping the islanded area via a flooded access road. Refer to Section 6.2 for the flood action definitions.

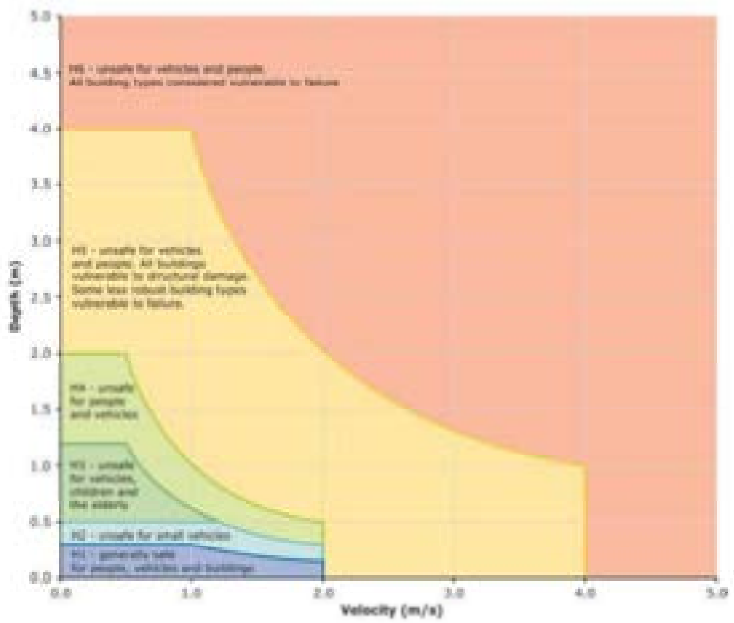

Figure 5.1: General flood hazard vulnerability curves (Figure 6 AEM7)

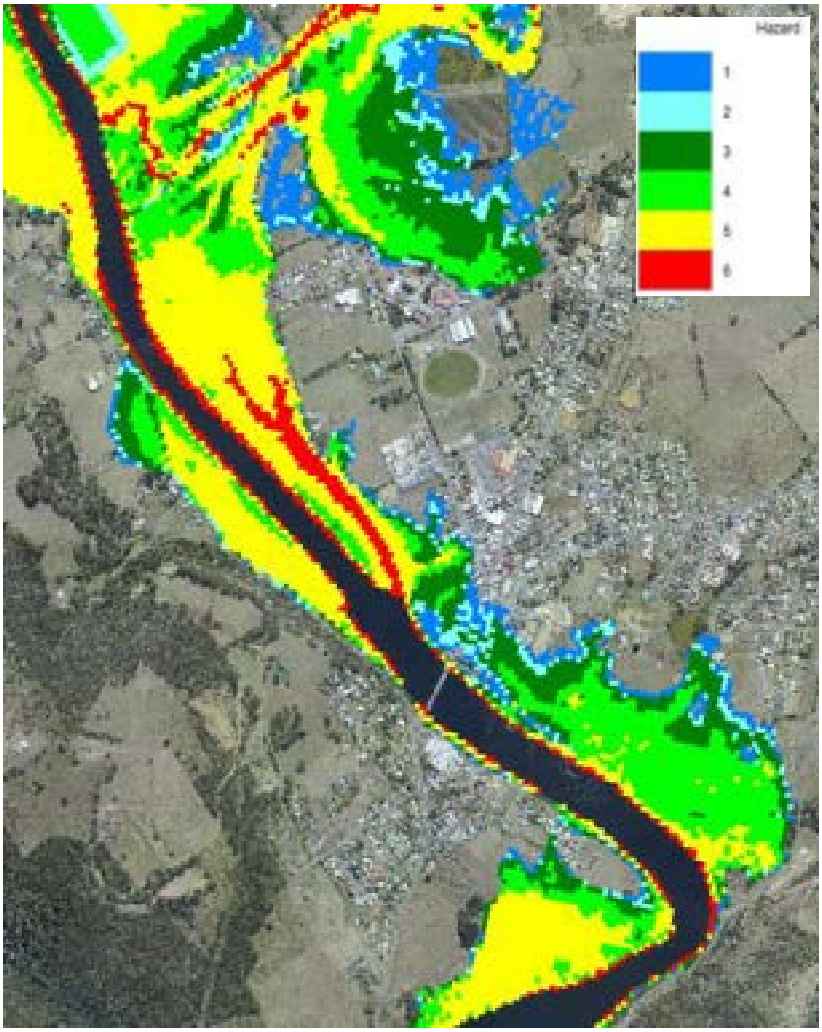

Figure 5.2: 1% AEP flood hazard

5.2.2 Population at risk

The population at risk (PAR) during a flood event includes:

- Those within buildings.
- “Itinerants” on roads, crossing bridges and in public places.
- Those at locations that can become “islanded” by flood waters.

The PAR for the modelled scenarios has been estimated based on the number of inundated buildings and the assumption of 2.5 occupants per building. It should be noted that this is not a detailed population at risk assessment taking into account of likely occupancy of commercial buildings or whether the flood occurs at night or during business hours.

The estimated populations at risk is provided in Table 5.1.

The itinerants at roads also form a part of the population at risk. When a flood event is predicted, SES and Police will close roads and redirect itinerants.

Areas that can become islanded are shown on the flood inundation maps. A summary of areas that can become "islanded" is provided below:

- Properties to the west of Wilmot Road either side of Mountain River.
- Huonville fronting the Huon River along Short Street and the Channel Highway.
- South east end of Coolstore Road.
- Property to the west of Flood Road.
- Southern end of Rookwood Road for extremely large flood events only.

It is strongly recommended that potential islanded areas are evacuated as soon as possible after initial notification to allow sufficient time for evacuation to occur prior to roads being inundated.

Table 5.1: Estimated buildings and population at risk located within various flood zones

Flood zone	Natural floods			Dambreak floods					
	6m at Judbury	7m at Judbury	8m at Judbury	Scotts Peak Dam DCF+DB	Scotts Peak Dam SDF	Edgar then Scotts Peak SDF	Edgar and Scotts Peak SDF	Edgar SDF	Scotts Peak East Saddle Dam SDF
A	0 (0)	0 (0)	0 (0)	19 (48)	18 (45)	19 (48)	17 (43)	10 (25)	8 (20)
B	1 (3)	1 (3)	4 (10)	73 (183)	51 (128)	55 (138)	42 (105)	26 (65)	23 (58)
C	1 (3)	0 (0)	1 (3)	99 (248)	40 (100)	49 (123)	20 (50)	3 (8)	2 (5)
D	2 (5)	1 (3)	2 (5)	68 (170)	68 (170)	68 (170)	68 (170)	67 (168)	67 (168)
E	0 (0)	0 (0)	1 (3)	140 (350)	132 (330)	135 (338)	123 (308)	37 (93)	19 (48)
F	4 (10)	15 (38)	45 (113)	370 (925)	370 (925)	370 (925)	370 (925)	334 (835)	312 (780)
G	0 (0)	0 (0)	0 (0)	96 (240)	82 (205)	86 (215)	72 (180)	26 (65)	24 (60)
H	4 (10)	10 (25)	8 (20)	217 (543)	176 (440)	182 (455)	155 (388)	85 (213)	75 (188)
I	0 (0)	0 (0)	0 (0)	22 (55)	13 (33)	14 (35)	11 (28)	7 (18)	7 (18)
J	0 (0)	0 (0)	0 (0)	66 (165)	2 (5)	2 (5)	1 (3)	0 (0)	0 (0)
K	0 (0)	0 (0)	0 (0)	13 (33)	3 (8)	3 (8)	3 (8)	1 (3)	1 (3)
Total buildings (PAR)	**12 (30)**	**27 (68)**	**61 (153)**	**1183 (2958)**	**955 (2388)**	**983 (2458)**	**882 (2205)**	**596 (1490)**	**538 (1345)**

Note: PAR values are shown in brackets ().

5.2.3 Roads and bridges

During a flood event some low lying roads may become inundated requiring closure.

Tasmanian Police (Ph: 131444) have the authority to close roads and should be notified if roads are likely to be affected by flood water.

The roads likely to be affected by rising flood waters up to and including the modelled dambreak floods are summarised below. Refer to the Flood Reports in Appendix E for roads affected by each flood event modelled for this FEP.

- Channel Highway (between Main Street and Flood Road).
- Wilmot Road near Mountain River.
- Glen Huon Road (approximately 1km from the bridge).
- Huon Highway north of Franklin (locally known as Short Straight).
- Streets within the Huonville town centre.

The bridges likely to be affected by rising flood waters up to and including the modelled dambreak floods are summarised below. Table 5.2 and Table 5.3 show the predicted water levels and inundation depths of the following bridges:

- Tahune Bridge.
- Manuka Road Bridge.
- Judbury Bridge.
- Huon Bridge.

Table 5.2: Flood water levels (m AHD) at selected road bridges

Bridge (Deck level)	Natural floods (m AHD)			Dambreak floods (m AHD)					
	6m at Judbury	7m at Judbury	8m at Judbury	Scotts Peak Dam DCF+DB	Scotts Peak Dam SDF	Edgar then Scotts Peak SDF	Edgar and Scotts Peak SDF	Scotts Peak East Saddle Dam SDF	Edgar SDF
Tahune Bridge (50.9 m AHD)	**51.4** (0.5)	**52.2** (1.3)	**53.2** (2.3)	Not estimated	**71.0** (20.1)	**71.8** (20.9)	**69.6** (18.7)	**63.3** (12.4)	**62.0** (11.1)
Weld Rd Bridge (39.7 m AHD)	36.9 -(2.8)	37.9 -(1.8)	39.2 -(0.5)	Water level not estimated for dambreak scenarios					
Judbury Bridge (21.7 m AHD)	17.1 -(4.6)	18.0 -(3.7)	18.8 -(2.9)	**33.6** (11.9)	**33.2** (11.5)	**33.9** (12.2)	**31.6** (9.9)	**25.5** (3.8)	**24.2** (2.5)
Huonville Bridge (4.1m AHD)	2.2 -(1.9)	2.5 -(1.6)	2.9 -(1.2)	**19.4** (15.3)	**14.4** (10.3)	**15.0** (10.9)	**13.0** (8.9)	**8.4** (4.3)	**7.5** (3.4)

Note:
Flood water depths above or below (-) the deck level are shown in brackets ().
Flood levels greater than bridge deck levels are shown in **BOLD**

Table 5.3: Flood water levels (m Huon Bridge gauge) at selected road bridges

Bridge (Deck level)	Natural floods (m gauge)			Dambreak floods (m gauge)					
	6m at Judbury	7m at Judbury	8m at Judbury	Scotts Peak Dam DCF+DB	Scotts Peak Dam SDF	Edgar then Scotts Peak SDF	Edgar and Scotts Peak SDF	Scotts Peak East Saddle Dam SDF	Edgar SDF
Tahune Bridge (52.3 m gauge)	**52.8** (0.5)	**53.6** (1.3)	**54.6** (2.3)	Not estimated	**72.4** (20.1)	**73.2** (20.9)	**71.0** (18.7)	**64.7** (12.4)	**63.4** (11.1)
Weld Rd Bridge (41.1 m gauge)	38.3 -(2.8)	39.3 -(1.8)	40.6 -(0.5)	Water level not estimated for dambreak scenarios					
Judbury Bridge (23.1 m gauge)	18.5 -(4.6)	19.4 -(3.7)	20.2 -(2.9)	**35.0** (11.9)	**34.6** (11.5)	**35.3** (12.2)	**33.0** (9.9)	**26.9** (3.8)	**25.6** (2.5)
Huonville Bridge (5.4m gauge)	3.6 -(1.9)	3.9 -(1.6)	4.3 -(1.2)	**20.8** (15.3)	**15.8** (10.3)	**16.4** (10.9)	**14.4** (8.9)	**9.8** (4.3)	**8.9** (3.4)

Note:
Flood water depths above or below (-) the deck level are shown in brackets ().
Flood levels greater than bridge deck levels are shown in **BOLD**

The Department of Infrastructure Energy and Resources are responsible for the following highways within the Huon Valley:

- Huon Highway.
- Channel Highway.
- Glen Huon Road.
- Ranelagh Secondary Road.
- Lymington Road.
- Nicholls Rivulet Road.
- Hastings Tourist Road.

Signs should not be erected on State controlled roads unless authorised by the Department of Infrastructure Energy and Resources.

In the event of an authorised road closure, temporary warning signs should be placed at appropriate locations (in both directions) to warn the motoring public of the danger and advising of any detours.

Opening roads and bridges after flooding

To assist in the recovery after flooding it is important that roads closed due to flooding be opened as soon as possible.

Roads should be continually monitored to ascertain if access is permissible and what damage if any has been caused. In assessing roads consideration should also be given as to whether certain classes of vehicles should be restricted from using the road until repairs have been carried out.

If damage has been caused to roads then the appropriate warning signs shall be erected prior to allowing public access.

With State highways, the Department of Infrastructure Energy and Resources should be contacted to have their contractor regularly check the road network with the aim of opening roads to the public as soon as possible.

Where roads have been opened the Tasmania Police and media should be advised as soon as possible.

5.2.4 Electricity distribution – underground power – Main Street Huonville

Underground power is located in the Huonville CBD on both sides of the Main Street, south of the roundabout. In this area fuse boxes are at ground level and are subject to inundation.

The power cables to the fuse boxes remain live until disconnected at the respective ground mounted substations. The removal of the fuses within the cabinets only impacts on the power supply to the buildings.

There are two substations servicing the area from the roundabout through to the Huon River bridge.

One substation is located in the carpark near the main sewer pump station near the supermarket and services the western side from the supermarket south to the river and into Short Street and the eastern side across the road to service Bennetts Tyre Service and the Grand Hotel.

The second substation is located in Skinner Drive behind the Huon Central complex and services the eastern side of Main Street from the Banjos Bakery through to Parks and Wildlife Service.

The two substations are capable of being linked.

Two substations service the area north of the roundabout up to and including the Woolworths shopping complex.

One substation is located in Wilmot Road and is the primary feed for both sides of Main Street.

The second substation is located at the Woolworth's shopping complex and it can also feed south to service the area covered by the Wilmot Road substation.

If there is a danger of flood waters entering the Main Street area then a decision will have to be made as to whether to have the power supply at the two southern substations turned off.

The areas likely to suffer inundation are that area south of the roundabout and the fuse box at the Legs 'N' Breast complex (impacted upon by water coming down the major drain from Shield Street).

This will of course result in adverse reactions from the businesses and therefore this decision will need to be based on solid information from the Flood Desk – Bureau of Meteorology. Likewise, a decision should be made at an appropriate time so that there is no risk of flood water entering any of the ground fuse boxes and therefore having the danger of people being electrocuted.

If there is a risk of flooding within Main Street then it would be appropriate to advise the businesses of the risk and the fact that they may lose power to their building.

5.2.5 Telephone system

It is likely that landline telephone systems in the area will be disrupted due to flood damage and telephone usage may either reach or exceed the system capacity. Mobile phone coverage is already limited in the region which will add to the issue.

5.2.6 Water supply systems

It is likely that the reticulated water supply systems will be disrupted in Huonville.

5.2.7 Sewage disposal systems

It is likely that sewage disposal facilities, including pump stations and septic tanks, may be out of service due to damage in Huonville. This may cause sanitation problems for properties connected to these facilities and located downstream of these facilities.

5.3 Flash flooding problems

While not specifically covered by this FEP there should be an awareness of the risks associated with flash flooding. HVC and the SES have jointly prepared *Standard operating Procedures for Flash Flooding*. These procedures should be followed in a flash flood event. In summary:

- Experience has shown that at times of flash flooding, storm water inlets are likely to be covered quickly by debris brought down with the flood.
- Resources are to be allocated for the regular checking of storm water inlets within the urban areas.
- Personnel assigned to carry out checking or clearing of storm water inlets are to be advised as to the potential risks and such personnel are required not to place themselves in a dangerous situation. If in doubt the employee should contact the Emergency Operations Centre (if operating) or their supervisor.

6. Evacuation management

6.1 Warning, alerting and activation

For natural flood events there will be a significant lead time from the prediction of large to extreme rainfall events and the arrival of the flood peak at the sites of interest. The BoM will provide the Huon Valley Flood Warning System (HVFWS) and HT Flood Warning System (FWS) with input rainfall estimates up to seven days prior to the event, provided their systems remain operational.

This does not mean that a full seven day warning will be provided with precision but it does mean that a 'heads-up' alert could be provided between two and seven days prior to the event. If the alert is actioned according to this plan, there will be sufficient time to implement an appropriate response. It is expected that a large flood event will be known at least 24 hours in advance.

The warning lead time for dambreak floods from the onset of dam failure is approximately 2 hours for the Tahune Airwalk and 6 to 10 hours for Huonville. Refer to Table 3.3 for details.

Given the isolated nature of the dams, evacuation must be actioned on the predicted outputs of the Hydro Tasmania flood warning system twenty four hours prior to the predicted peak and the advice given by Hydro Tasmania on the performance of their assets during the flood conditions.

The warning and alerting sequence is a part of the decision making process detailed in the flowchart in Section 4. A comprehensive flood warning system has a number of essential components as detailed below.

Predictions - A capacity to predict flood severity including the time of arrival of the flood. A prediction is expressed in terms of a flood level at a fixed location (such as Judbury gauge site or Huonville gauge site) and includes the time at which the expected flood peak will occur. Rainfall forecasts are made by the BoM, and are based on observations within the catchment and the predictions of meteorological models. The HVFWS uses this information to predict flows within the Huon River and its tributaries leading to forecast water levels at the Judbury and Huonville gauge sites. Hydro Tasmania's Gordon River flood warning system uses this information to model natural inflows which are then routed through the storages in accordance with a set of rules that govern the operation of the Gordon Power Scheme. This information is used to provide early warning of flood conditions at the dams, where the dam is forecast to reach or exceed the historic high.

Interpretations - An interpretation of the prediction is required to indicate the spread of water and what it will affect. This means translating the predicted flood levels into descriptive terms relevant to the flood consequence studies. The hydraulic modelling carried out for the Huon River has been used to develop flood inundation maps and Flood Reports describing the impact of flooding on infrastructure and buildings.

Warning messages - Warning messages provide advice on:

- what is happening and where it is happening;
- what the flood predictions will mean for the community;

- what the community needs to do to respond; i.e. await further advice, be ready to evacuate, means of evacuation and evacuation routes.

A sample warning message is shown in Appendix A.

Communication to the public and warnings should be facilitated through:

- Standard emergency warning system (SEWS).
- Emergency alert (EA).
- Websites and social media outlets – coordinated by the lead agent with other organisations needing to liaise with them before public announcements
- Radio/TV – ABC Local Radio and 7XS

Communication - The transfer of flood messages to those at risk should be timely and designed to promote the appropriate response. Flood prediction capabilities have improved considerably but this will be of little use if warning messages are not delivered in a way that ensures that they will be heard, understood and acted upon by all persons that are considered to be at risk from a flood event. There will need to be more than one method of conveying messages to the community (e.g. radio, TV, phone and personal contact).

The community will be provided with all available information on floods, so that when a severe flood is predicted, members of the public will have confidence in the messages they receive and take the appropriate actions.

Transmission of the warning via the media is not a reliable mechanism of ensuring that all property owners are advised and should therefore not be used as the only form of distribution. Other forms of distributing warning messages include telephone calls, SMS, email, doorknocking, fax or community briefings. Emergency management personnel should note, however, that in dambreak flood events there is limited time for direct contact with property owners by Tasmania Police, SES and Council staff.

6.2 Flood triggers and actions

Triggers are predicted flood levels for specific scenarios. The triggers for issuing warnings and taking actions are based on predicted water levels at the upstream reservoirs for specific scenarios. Section 3 discusses the trigger levels for different AEP natural floods and dambreak scenarios at Lake Pedder.

Actions for the affected community should be separated into what to do before a flood, during a flood and after a flood. This information should be communicated through an education program which is discussed further in Section 8 of this FEP.

Actions in the event of a flood event may include any or all of the following:

- Issue of public warnings through various media
- Road closure
- Self-evacuation to a safe refuge to local high ground until the flood waters abate
- Evacuation out of the flood affected area.

Details of houses and facilities to be evacuated under a range of flood scenarios are presented in the flood reports in Appendix E. The inundation areas for these flood scenarios are presented in the flood inundation maps in Appendix D.

These flood reports recommend taking the following actions based on the inundation level at a particular building and for islanded areas water depth over the access road:

Buildings

- **No action** - water level is more than **0.4** metres **below** the floor of the property;
- **Monitor** - water level is between **0.4** metres and **0.1** metres **below** the floor of the property;
- **Sandbag** - water level is between **0.1** metres below and **0.3** metres **above** the floor of the property; and
- **Evacuate** - water is more than **0.3** metres **above** the floor of the property.

Islanded areas

- **Monitor** - water level is **between 0** metres and **0.3** metres over the access road.
- **Evacuate** – water level is **greater** than **0.3** metres over the access road.

Note: the flood reports have been derived using a 1m vertical buffer (above predicted flood level) to capture all houses that may be outside of the modelled flood extent but whose floor levels fall into the above evacuation rules.

6.3 Emergency response categories

In the Australian Emergency Management Handbook 7, (2013, AEMI), it is recommended that an emergency response category maps be prepared to assist with flood risk management. The maps show floodplain classifications as per *Flood Preparedness* Manual 20 (2009). Definitions of the floodplain functions are shown in Table 6.1 Floodplain functions were determined as part of the FEP and are shown on the flood inundation maps in Appendix D.

Table 6.1: Floodplain functions definitions as defined in Flood Preparedness Manual 20, Annex D

Access road cut and no overland or alternative road access possible	Island below predicted flood level	N/A	**Low flood island ('shrinking island')**
	Island above PMF	May or may not have failed	**High flood island**
Access road cut and no overland or alternative road access possible	Below predicted flood level	N/A	**Low trapped perimeter**
	Above PMF	May or may not have failed	**High trapped perimeter**
Access road cut but overland escape/rescue possible on foot or AWD vehicle	Below predicted flood level	N/A	**Overland escape route**
Access uninterrupted and via all-weather rising road (usual route or alternative)	Below predicted flood level	N/A	**Rising road access**
Access uninterrupted and via all-weather rising road (usual route or alternative)	Above predicted flood level	One or more services failed	**Indirectly affected area**

6.4 Evacuation management

The criteria for evacuation and for closing roads have been determined in consultation with Tasmania Police, SES and the Huon Valley Council with the primary objective being life risk reduction. These criteria are the:

- Direct threat to life from rapidly flowing water.
- Difficulty of living in a flooded structure.
- Possible adverse health consequences of living in a flooded or recently flooded area.

The levels of bridges and low-level roads have been used to determine which evacuation routes may be available, or when evacuations may need to be made prior to the flood because the predictions indicate that these routes will be blocked. Road closures for through-traffic may also be necessary. Evacuation route maps are provided in Appendix D.

Tasmania Police/SES will be responsible for managing evacuations and will also attempt to maintain security over properties that have been evacuated. The actions in the warning message should be followed, with periodic monitoring of flood levels and road and bridge conditions. Huon Valley Council staff will assist Tasmania Police and SES where requested.

In some instances, evacuations may be required well in advance of actual flooding. This will be the case when it is known that the expected flood will block roads and bridges that provide the only evacuation route from affected properties.

Evacuation centres will be established by the Huon Valley Council with support from the Department of Health and Human Services and other agencies at suitable public centres.

These centres will be provided with a range of facilities and services to sustain the evacuees for the period of the flood. They may be in operation for a period after the flood until properties can be reoccupied. The centres will remain as the focal points for communities and should provide advisory services on a range of flood related issues such as status of floods at the concerned locations, status of evacuation of the residents, weather forecasts and safety advice as well as arranging for the delivery of essential supplies to people isolated by floodwater.

It is anticipated that the residents will undertake self-evacuation along the prescribed route upon request by SES or Tasmania Police, based on warning advisories or based on physical observation of river conditions.

6.5 Communications during evacuation

It is desirable to establish direct communication links between BoM, SES, Tasmania Police and the Huon Valley Council during natural flood events. The SES is the direct communication link between these organisations. During natural flooding, when disturbance to electricity and telecommunication infrastructure is less likely, the existing telecommunication system can be used as the direct communication link between the parties. But during large flood events, because of potential disruption to electricity supply and telecommunications, a radio communication or satellite phones are the preferred communication method.

Communication with the communities at risk of flooding is an important link that must be the subject of regular validation to ensure that the dissemination of flood warnings is timely and elicits the appropriate response.

6.6 Evacuation information and maps

6.6.1 Natural flood events

The modelled natural flood events equivalent to 6m, 7m and 8m at the Judbury gauge:

- Inundate property at the following townships:
    - Some river front property at Glen Huon.
    - Huonville to the west of Wilmot Road and Skinner Drive, resulting in potential islanding of properties along Short Street and the Channel Highway.
    - Huonville on the western side of the river and potential islanding of properties at the south-east end of Coolstore Road.
    - Huonville near Mountain River with potential Islanding of properties to the east of Wilmot Road either side of Mountain River.
    - Franklin river front.
- Inundate rural property along low lying areas of the Huon River floodplain.
- Cut roads at the following locations:
    - Glen Huon Road approximately 500m upstream of the Huon Bridge.
    - Wilmot Road for approximately 500m south of Mountain River.
    - Short Straight on the Huon Highway north of Franklin.
    - Channel Highway between Huonville and Flood Road.

The extent of inundation is dependent on the magnitude of the natural flood event.

Population at risk of flooding should be moved to higher ground along rising road access (RRA).

Where islanding has been identified, (three locations within Huonville) the population in these areas should be evacuated early to prevent isolation from occurring.

Flood inundation maps showing emergency response functions are provided in Appendix D.

The following flood reports for natural floods have been prepared and are provided in Appendix E:

- Flood Report No 1: 6m flood at Judbury gauge.
- Flood Report No 2: 7m flood at Judbury gauge.
- Flood Report No 3: 8m flood at Judbury gauge.
- Flood Report No 4: Dam crest flood and failure of Scotts Peak Dam.
- Flood Report No 5: Sunny day failure of Scotts Peak Dam.
- Flood Report No 6: Sunny day simultaneous failure of Scotts Peak and Edgar Dams.

- Flood Report No 7: Sunny day failure of Edgar Dam followed by failure of Scotts Peak Dam.
- Flood Report No 8: Sunny day failure of Scotts Peak East Saddle Dam.
- Flood Report No 9. Sunny day failure of Edgar Dam.

6.6.2 Dambreak flood events

For dambreak flood events significant inundation for roads and property along the Huon River is predicted to occur.

Flood inundation maps for the modelled dambreak scenarios have been prepared but are not included in this FEP.

The following flood reports for dambreak floods have been prepared and are provided in Appendix E:

- Flood Report No 4: Dam crest flood and failure of Scotts Peak Dam.
- Flood Report No 5: Sunny day failure of Scotts Peak Dam.
- Flood Report No 6: Sunny day simultaneous failure of Scotts Peak and Edgar Dams.
- Flood Report No 7: Sunny day failure of Edgar Dam followed by failure of Scotts Peak Dam.
- Flood Report No 8: Sunny day failure of Scotts Peak East Saddle Dam.
- Flood Report No 9. Sunny day failure of Edgar Dam.

6.7 Evacuation times

The strategy of evacuation and the estimated evacuation time at the various regions for natural flood and dambreak flood scenarios is shown in Table 6.2.

*For an up-to-date list of key resource contacts for emergency responses, refer to Huon Valley Council and SES contact lists.

** For an up-to-date list of evacuation meeting points refer to the list in the *Huon Valley Municipal Emergency Management Plan, West Coast*; (Issue 6 2015, Huon Valley Council).

Note: All notifications need to be directed to Tasmania Police who will then coordinate with SES and Huon Valley Council (HVC).

Table 6.2: Evacuation strategy and response time – Glen Huon, Huonville and Franklin

Region	Scenario	Resources*	Steps taken	Where to evacuate to**	Estimated time required
Glen Huon Huonville Franklin Tahune Airwalk	Natural floods (e.g. 6m, 7m, and 8m at Judbury gauge)	• Tasmania Police • SES • Council Staff *(Number of resources will be as coordinated by Tasmania Police)*	• Door knocking • Media alerts • Evacuation registration • Road closures	• Higher ground or evacuation meeting points	4 hours
	Dambreak flood events.		• Door knocking • Media alerts • Evacuation registration • Road closures	• Higher ground or evacuation meeting points	8 hours

6.8 Order of priority to evacuate

The HVC in participation with the Tasmania Police/SES will:

1. Attempt to identify any additional groups or individuals requiring extra assistance.
2. Ensure warning dissemination successfully reaches:
    - tourist accommodation providers
    - parks
    - river activities
    - camps and camping facilities along the Huon River.

6.9 Evacuation centres

Section 5.7 of the Huon Valley Emergency Management Plan (HVEMP) lists community centres that may be useful for managing emergencies. Not all centres are suitable for use during a flood event. Table 6.3 lists evacuation centres that **ARE NOT SUITABLE** for use during natural and dambreak flood events as they may be close to inundated areas or could be potentially inundated for larger than expected flood flows.

Potential isolation of population centres should also be considered when planning evacuation centres.

Table 6.3: Unsuitable evacuation centres

NOT suitable for natural floods (up to approximately 8m flood level at Judbury gauge)	**NOT suitable for dambreak floods**
Huonville Town Hall	Huonville Town Hall
Franklin Club Rooms	Huonville Recreation Ground, Huon Valley PCYC, Huonville Football Clubrooms.
	Franklin Club Rooms
	Palais Theatre
	Shipwright Point Regatta Ground
	Port Huon Sports and Aquatic Centre

6.10 Emergency operations centres

Any major flood in the Huon River system will affect Huonville as well as other low-lying areas. An Incident Control Centre (ICC) will need to be located centrally and should be able to manage the responses of all affected areas.

The Huon Valley SES Unit has experience in the function of Incident Control Centre (ICC) and therefore in the event of an imminent flood the Unit Manager or (in their absence) Deputy Unit Manager shall be contacted.

An ICC may be established by the Municipal Coordinator as Centre Controller. The ICC shall be used to co-ordinate information and resources. The location of the ICC shall be dependent on the location of the "event".

The ICC will need to have the capacity to communicate and provide a range of resources to those responsible for implementing the emergency response (incident management team). The Huon Valley Council, Tasmania Police and SES will set up the emergency operation centre.

The operations centre will be the focal point for all tactical decisions relating to evacuation, road closures, evacuee centres and the provision of services to all affected people. There will be senior staff from SES and Tasmania Police who will form the incident management team during an emergency.

For smaller flood events the Huon Valley SES Unit Headquarters located in Skinner Drive Huonville would be a suitable location, however for larger flood events and dambreak scenarios the Huon Valley SES Unit Headquarters is not a suitable location for the ICC as it will be inundated. Huon Valley SES Unit contact details are contained in Section 2.10 of this plan.

6.11 Relocation of animals from property to be flooded

Property owners or occupiers of properties likely to be flooded should be notified if possible as to potential impact upon animals grazing within the flood zone. SOPs are currently under development by HVC for animal relocation.

Council is not responsible for relocating endangered animals, however Council may provide assistance where possible.

6.12 Transport

Evacuation by boat is not recommended. It is unlikely that boats will be used for evacuation due to difficulty in manoeuvring in fast-flowing flood waters and the hazards posed by floating debris.

After roads have been closed, it may be possible that access through flood waters could be made with large vehicles with a snorkel or high air intakes, if there is an urgent need of doing so. Such access should only be attempted when flow velocities are low and by experienced persons familiar with the road.

Driving, riding or walking through the flood water at any time is dangerous and should be avoided.

When high flood waters prevent vehicles access, evacuation shall be carried out using a helicopter or by foot to high ground considering the time available and remoteness of the location.

6.13 Council resources available for use

Council's resources will be used to assist in a community crises or emergency and in accordance with the Huon Valley Emergency Management Plan.

The objective behind the use of Council resources is to help the community in any reasonable manner. As Council resources are limited, they must be applied for the greatest good, so residents and businesses are expected to help themselves where possible. Some decisions may be controversial, when reviewed with the benefit of hindsight, so keep notes of why certain decisions were made and the expected outcome.

Section 5.6 of the Huon Valley Emergency Management Plan (HVEMP) lists heavy and small plant and equipment located in the Huon Valley area (owned by HVC and privately) that could potentially be used in a flood emergency.

6.14 Media and public information

At various stages of a major event it may be necessary for contact to be made with the media (radio, television and newspaper) in order that the community can be kept informed of anything that may adversely affect them.

Tasmania Police / SES will be responsible for coordinating public warnings and media liaison. If an ICC has been established (either by SES for natural flooding or Tasmania Police for dambreak flooding), then it is preferable that media requests be referred to the ICC so that a coordinated approach can be made in relation to press releases/information.

The Huon Valley Council, SES and Tasmania Police (as required depending on whether flooding is natural or dambreak related) will prepare regular community information sheets and media statements. They will provide details of the likely effects of the floods and where the community can seek advice on such matters as: insurance issues, legal services, temporary housing and counselling.

All media releases made by Council shall be made via the General Manager and therefore enquiries from the media should be directed to the General Manager. Council's Community Relations Officer will coordinate the dissemination of information to all media outlets.

If dealing with the media it is important that the information relayed does not create confusion nor in any way infer that certain situations are caused by the actions or inactions of individuals - private companies or public utilities.

Under no circumstances is information relating to deaths or serious injury resulting from the situation be relayed to the press. This will be carried out by the police after next of kin etc. have been notified.

6.15 Finance

Each organisation will be responsible for its own expenditure on flood evacuation operations. State or Commonwealth governments may not reimburse such expenditures. Nevertheless, separate accounts should be kept of emergency expenditure in the event that reimbursement is made available through the natural disaster relief arrangements or some other funding source.

7. FEP management

7.1 FEP owner

The HVC is the owner of this FEP.

7.2 FEP holders

The organisations which are listed in Appendix B of this document are the plan holders.

7.3 FEP review and maintenance

It is the responsibility of the HVC, to review and maintain this FEP in consultation with the HVMEMC at least once every two years in accordance with the *Emergency Management Act 2006* (Section 35(5)).

Regular validation activities are to be undertaken by the following organisations to ensure the accuracy of the FEP:

- the Huon Valley Council
- the Police
- the State Emergency Service
- Hydro Tasmania
- the Department of Health & Human Services.

A review should investigate the benefits that additional survey data may provide to the FEP (e.g. additional floor level survey and river cross sections). The review should ensure that any new roads and buildings need to be surveyed and included in the FEP.

7.4 Revision history

A new issue history and amendment list will be issued each time a separate amendment is issued to holders of this document. Each amendment list is to replace this page and the next page, and both pages should then be destroyed.

Please ensure that required amendments are notified to:

Executive Officer

HVMEMC

c/- Huon Valley Council

40 Main Street ,Huonville, 7109

Table 7.1: Revision history

Issue date	Expiry date	Comments
December 2007	December 2009	Original issue.
August 2016	July 2018	FEP significantly revised to include new format, updated hydrologic and hydraulic modelling (resulting in new inundation maps and Flood Reports), consider houses constructed since previous version and revised BoM warning levels.

The following are recommended to be included/taken into consideration in the next revision of this FEP:

- Houses built since issue of this revision.
- Any changes to BoM warning levels.
- Any changes associated with changes to the Judbury gauge site rating curve (ie revision of hydrologic and hydraulic modelling).
- Any changes made by Hydro Tasmania to its Dam Safety Emergency Management Plan.
- Any changes made by HVC or SES in relation to flood evacuation planning.
- New emergency management regulations/guidelines.

7.5 Triggers for Plan reviews and updates

The FEP should be reviewed, and updated if required:

- By August 2018.
- If there are any changes to the Judbury gauge site rating curve.
- If there are any changes to the Bureau of Meteorology flood warning levels at the Judbury gauge site.
- If there are any changes to dambreak modelling carried out by Hydro Tasmania.

8. Public awareness strategies

8.1 Introduction

Although public awareness strategies are not the focus of this FEP, they have been made reference to in other FEP's prepared within Tasmania, and increased public awareness of flooding issues may assist the HVC and SES to better manage evacuations during a flood event.

This section briefly describes potential awareness strategies and potential resources to be used as education material.

8.2 Specific strategies

A public awareness education program is the most effective way of increasing knowledge of what to do prior to, during and after a flood. An effective program will significantly enhance the smooth operation of the FEP, minimise risks to life, reduce damages and significantly reduce demands on emergency service personnel for basic information during an emergency event.

Specific public awareness strategies to improve the understanding of the likelihood and consequence of different flood events include:

- publicity of selected key aspects of the FEP through local media, presentations to community groups and within local schools;
- display of a summary of the FEP at the local government offices;
- flood awareness materials distributed to residents and businesses located within the modelled flood inundation areas;
- for residents at risk of flooding, specific details of the risks, the warning procedures, the prediction to flood peak times, the expected water levels for the property, evacuation routes and evacuation centres, and the duration before flood waters will recede.

8.3 Education material

Community education material that could be prepared by HVC may include:

- What to do in a flood (http://www.bom.gov.au/water/floods/document/What_todo_floods.pdf)
- Emergency Management Australia, 2005 (http://www.ema.gov.au)

A significant body of work which addresses the above issues already exists so the HVC could adopt and adapt these for use on the Huon Valley region. A good example is the documentation that has been developed at Launceston City Council (LCC). The documents can be accessed through the links below:

- Flooding in Launceston, Launceston City Council http://www.launceston.tas.gov.au/upfiles/lcc/cont/_council/community_engagement/publications/flood_dl_brochurecombined_previous_brochure_trio.pdf

- Standby notice for evacuation, Launceston City Council
  http://www.launceston.tas.gov.au/upfiles/lcc/cont/_council/community_engagement/publications/1201_lcc_a4_flood_evacuation_info_sheet.pdf

Appendices

Appendix A – Sample warning message

Appendix B – Distribution list

Appendix C – Map of Huon River flood zones

Appendix D – Flood inundation maps and emergency response functions

Appendix E – Flood reports

Appendix F – Background information

Appendix G – Huon River flood modelling

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A Sample warning message

The primary objective of a warning system is to enable individuals and communities to respond appropriately to a threat to reduce the risk of death, injury, property loss and damage. An effective warning will inform each member of the community at risk of:

- what is happening;
- what it means to you; and
- what you can do.

An example of an effective warning message for flooding within the Huon River system is shown below.

Major Flood Warning

Major flooding is predicted for the Huon River from ..... to .....

Properties in low lying areas, including ....., will be flooded.

Houses will need to be evacuated before affected areas become isolated.

Residents will be advised by Tasmania Police or the State Emergency Service to evacuate before the flood peak when some roads will be blocked.

Evacuation centres will be established at ……..

If you are advised to evacuate you should:

- gather your medicines, personal valuables and papers, money, photograph albums and family belongings which you can carry or fit into a vehicle;
- turn off the power, gas, beware of fallen power lines and isolate your water supply; and
- go to your designated evacuation centre.

If you encounter flooded roads or bridges, **DO NOT** attempt to cross them. Move to high ground and seek shelter.

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B Distribution list

The current flood evacuation FEP is dated August 2016 and is distributed to the following organisations. Any copies of older FEPs should be removed and replaced with the current FEP.

Name of Organisation	Number of Copies
Huon Valley Council	**13**
General Manager (2)	
Executive Manager Infrastructure Services (1)	
Executive Manager Corporate Services (for distribution to telephone reception staff), (2)	
Risk Management Officer (1)	
Road Maintenance Coordinator (1)	
Capital Works Coordinator (1)	
Depot Clerk (1)	
Unit Manager Huon Valley S.E.S. Unit (1)	
ECM 02/35	
SES Unit Manager (2)	
Tasmania Police	**7**
Hobart (2)	
Huonville (2)	
Kingston (2)	
Southern Region Controller(1)	
Bureau of Meteorology – Flood Warning Centre	**1**
State Emergency Service	**4**
Regional Emergency Operations Centre South (1)	
Regional Emergency Management Officer (1)	
Manager Planning, Hobart (1)	
Library, Hobart (1)	
Department of Health and Human Services – District Manager	**2**
Hydro Tasmania	**2**
Forestry Tasmania, Geeveston	**1**
State Library	**1**
TOTAL	**31**

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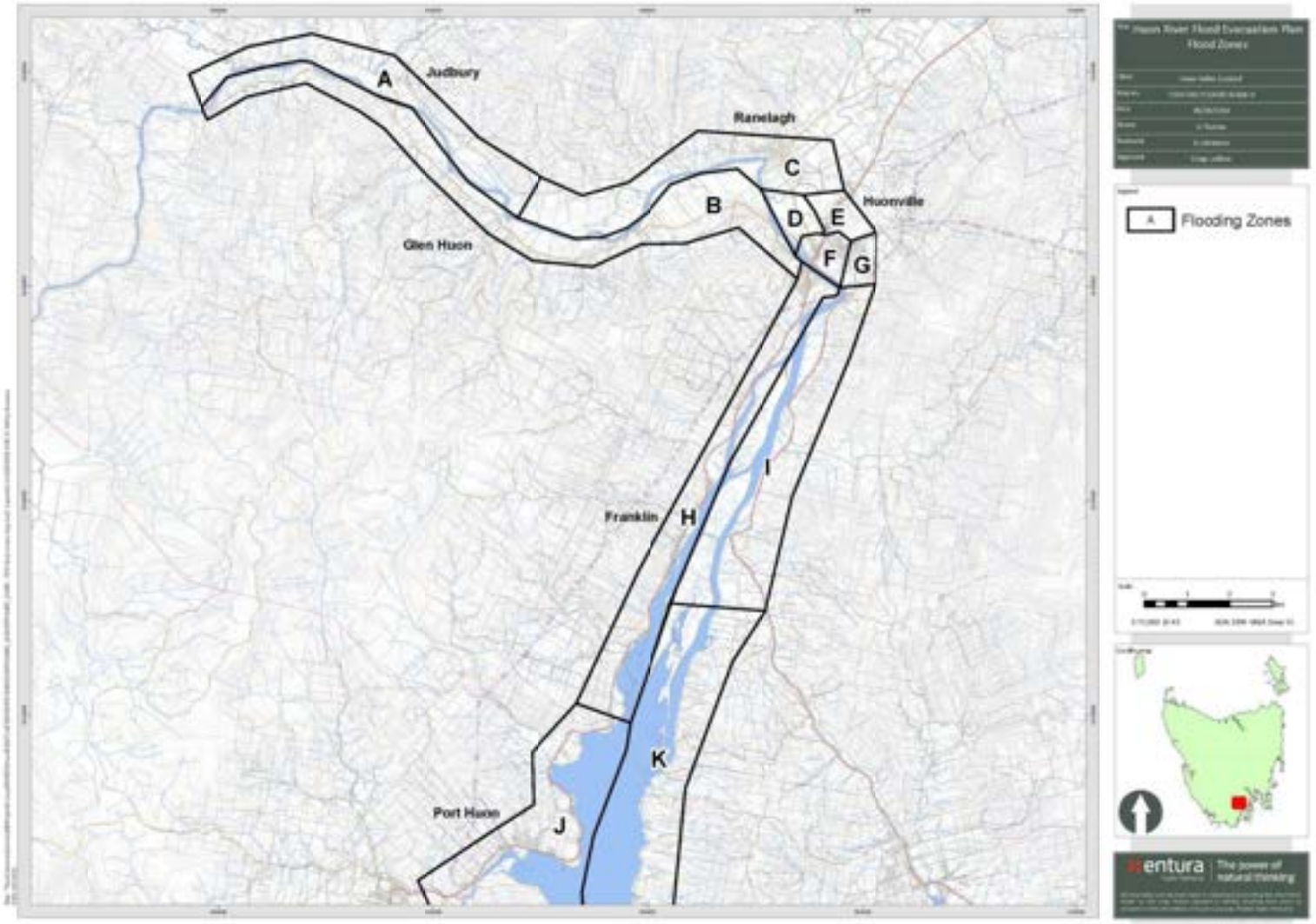
C Map of Huon River flood zones



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D Flood inundation maps and emergency response functions

Flood inundation maps are provided for a range of flood events in the Huon River. The inundation areas are based on the XP SWMM model results and other GIS information available for the Huon River.

Flood inundation maps have been prepared for the major population centres and for the major infrastructure in the Huon River between the Tahune Airwalk and Port Huon. The following maps have been prepared for the 4.0m, 6.0m and 7.0m Judbury flood events:

- Overall map covering Judbury through to Port Huon (A1).
- Tahune detail map (A3).
- Huonville detail map (A3).
- Franklin detailed map (A3).

The maps show the following information:

- Inundation extent.
- Buildings both affected and unaffected by the modelled flood extent.
- Flood discharge and flood levels at key locations.
- Flood travel time from Tahune and the Judbury gauge site.
- Areas islanded by flooding.
- Roads and bridges cut by flooding.
- Emergency response functions (as per Flood Preparedness Manual 20, Appendix D).
- Locations of emergency services and evacuation centres.

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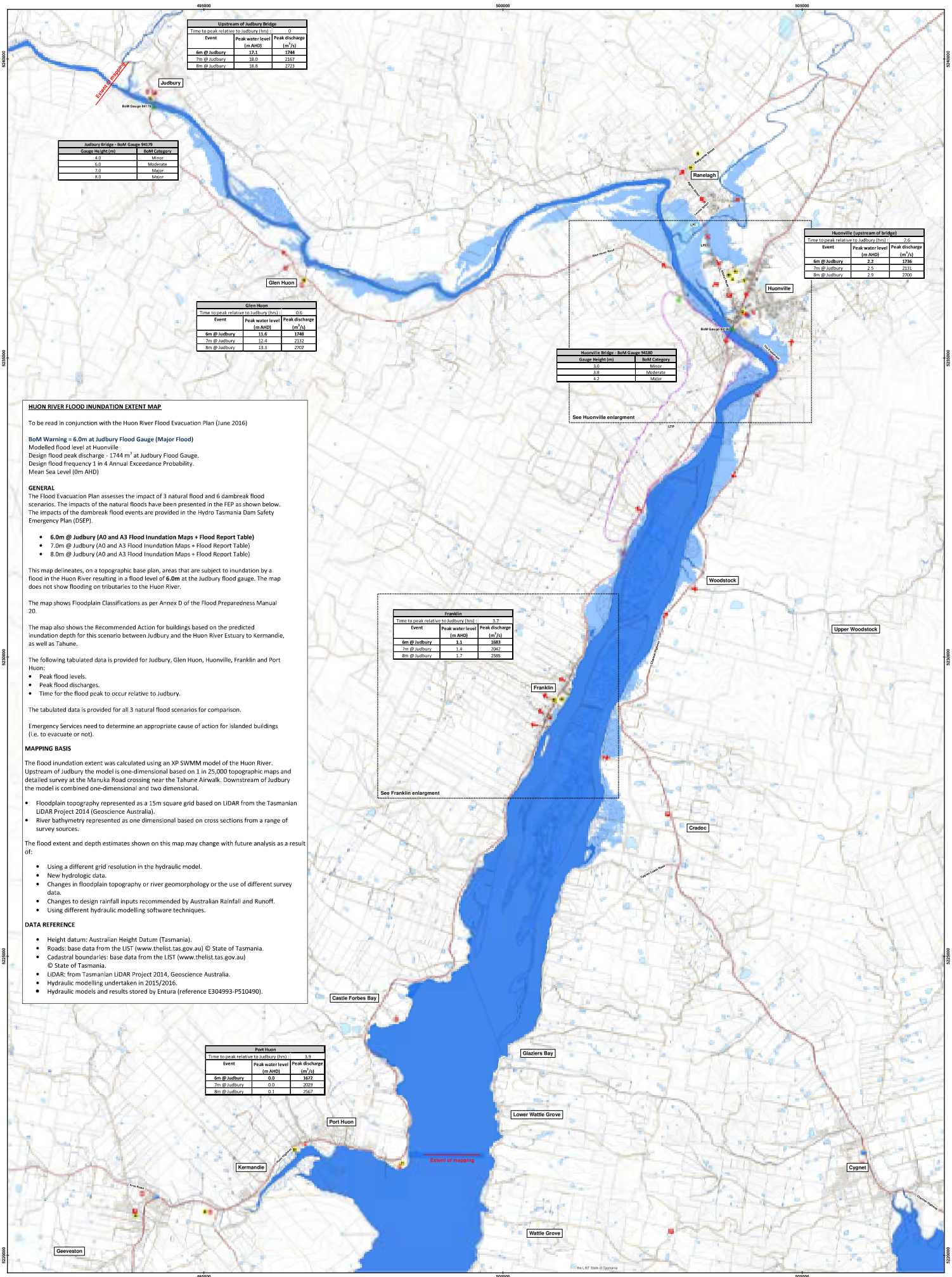


HUON RIVER FLOOD INUNDATION EXTENT MAP

To be read in conjunction with the Huon River Flood Evacuation Plan (June 2016)

BoM Warning = 6.0m at Judbury Flood Gauge (Major Flood)
Modelled flood level at Huonville
Design flood peak discharge - 1744 m^3 at Judbury Flood Gauge.
Design flood frequency 1 in 4 Annual Exceedance Probability.
Mean Sea Level (0m AHD)

GENERAL
The Flood Evacuation Plan assesses the impact of 3 natural flood and 6 dambreak flood scenarios. The impacts of the natural floods have been presented in the FEP as shown below. The impacts of the dambreak flood events are provided in the Hydro Tasmania Dam Safety Emergency Plan (DSEP).

- **6.0m @ Judbury (A0 and A3 Flood Inundation Maps + Flood Report Table)**
- 7.0m @ Judbury (A0 and A3 Flood Inundation Maps + Flood Report Table)
- 8.0m @ Judbury (A0 and A3 Flood Inundation Maps + Flood Report Table)

This map delineates, on a topographic base plan, areas that are subject to inundation by a flood in the Huon River resulting in a flood level of **6.0m** at the Judbury flood gauge. The map does not show flooding on tributaries to the Huon River.

The map shows Floodplain Classifications as per Annex D of the Flood Preparedness Manual 20.

The map also shows the Recommended Action for buildings based on the predicted inundation depth for this scenario between Judbury and the Huon River Estuary to Kermandie, as well as Tahune.

The following tabulated data is provided for Judbury, Glen Huon, Huonville, Franklin and Port Huon:
- Peak flood levels.
- Peak flood discharges.
- Time for the flood peak to occur relative to Judbury.

The tabulated data is provided for all 3 natural flood scenarios for comparison.

Emergency Services need to determine an appropriate cause of action for islanded buildings (i.e. to evacuate or not).

MAPPING BASIS

The flood inundation extent was calculated using an XP SWMM model of the Huon River. Upstream of Judbury the model is one-dimensional based on 1 in 25,000 topographic maps and detailed survey at the Manuka Road crossing near the Tahune Airwalk. Downstream of Judbury the model is combined one-dimensional and two dimensional.

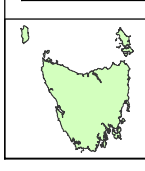
- Floodplain topography represented as a 15m square grid based on LiDAR from the Tasmanian LiDAR Project 2014 (Geoscience Australia).
- River bathymetry represented as one dimensional based on cross sections from a range of survey sources.

The flood extent and depth estimates shown on this map may change with future analysis as a result of:

- Using a different grid resolution in the hydraulic model.
- New hydrologic data.
- Changes in floodplain topography or river geomorphology or the use of different survey data.
- Changes to design rainfall inputs recommended by Australian Rainfall and Runoff.
- Using different hydraulic modelling software techniques.

DATA REFERENCE

- Height datum: Australian Height Datum (Tasmania).
- Roads: base data from the LIST (www.thelist.tas.gov.au) © State of Tasmania.
- Cadastral boundaries: base data from the LIST (www.thelist.tas.gov.au) © State of Tasmania.
- LiDAR: from Tasmanian LiDAR Project 2014, Geoscience Australia.
- Hydraulic modelling undertaken in 2015/2016.
- Hydraulic models and results stored by Entura (reference E304993-P510490).



Recommended Actions
- Evacuate
- Islanded
- Monitor
- No Action
- Sandbag
- Buildings (outside of flood zone)

Community places
- BoM - Flood gauge
- Community centres
- Ambulance
- Police
- Fire
- Nearby Safer Place
- SES

Floodplain classifications
- Road cut
- LFI: Low Flood Island
- HFI: High Flood Island
- LTP: Low Trapped Perimeter
- Overland escape route (OER)
- Rising road access from area (RRA)

Other mapping layers
- LIST State Cadastre
- Contours (major / minor)
- Major Roads
- Other Roads
- Vehicular Track
- Watercourse
- Flood Plain / Wetland
- Huon River and main waterways

Title	Huon River Flood Evacuation Plan 6.0m at Judbury Flood Gauge
Client	Huon Valley Council
Map no.	E304700-P510490-GIS03-0
Date	25/07/2016
Drawn	S.Thomas
Reviewed	A.Jokanovic
Approved	Craig Ludlow

SCALE: 1:20,000
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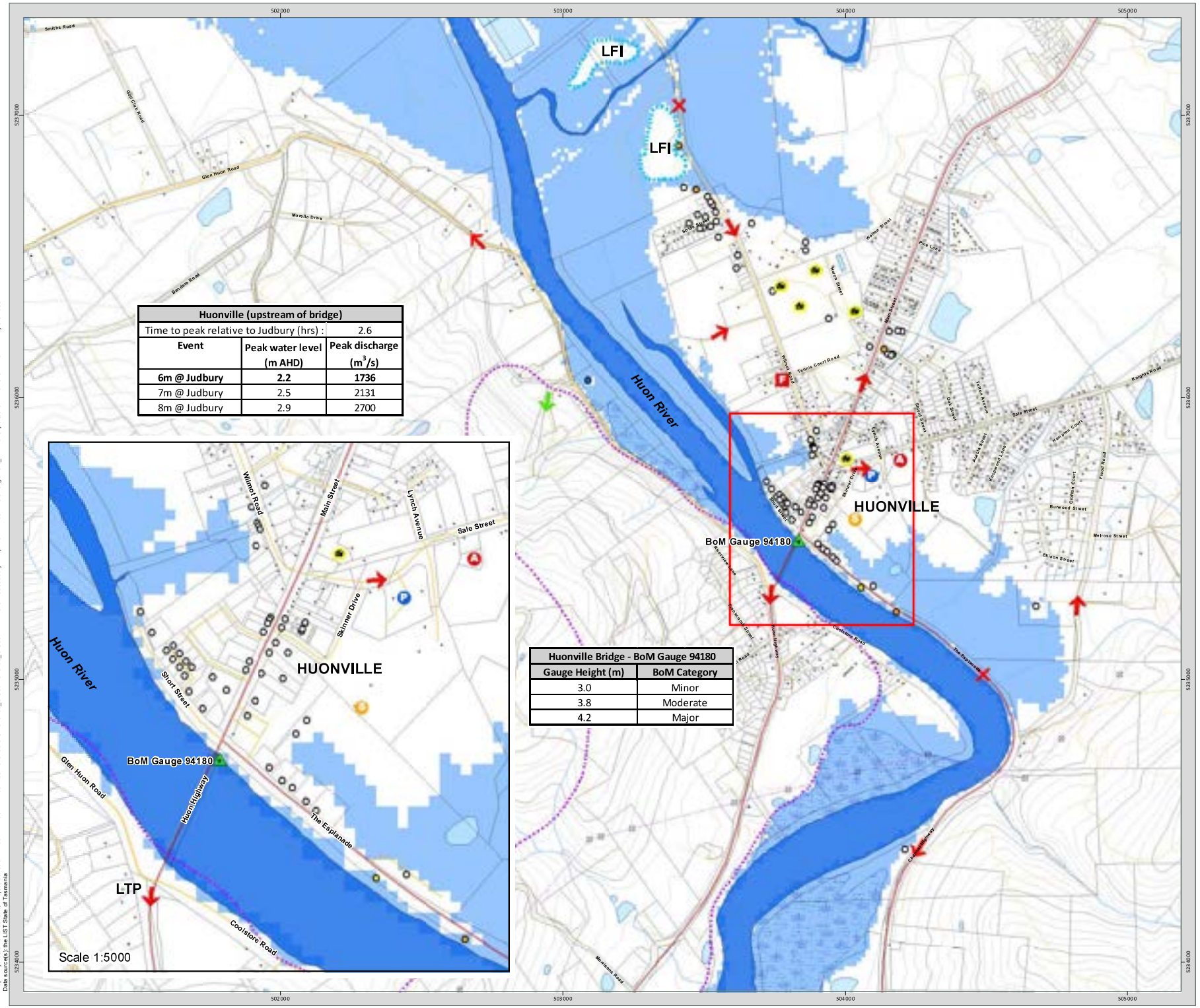

Huonville (upstream of bridge)		
Time to peak relative to Judbury (hrs) :		2.6
Event	Peak water level (m AHD)	Peak discharge (m^3/s)
6m @ Judbury	**2.2**	**1736**
7m @ Judbury	2.5	2131
8m @ Judbury	2.9	2700

Huonville Bridge - BoM Gauge 94180	
Gauge Height (m)	BoM Category
3.0	Minor
3.8	Moderate
4.2	Major

Huon River Flood Evacuation Plan 6.0m at Judbury Flood Gauge Huonville Enlargement

Client	Huon Valley Council
Map no.	E304700-P510490-GIS03-0
Date	26/07/2016
Drawn	S.Thomas
Reviewed	A.Jokanovic
Approved	Craig Ludlow

Legend

Area Inundated

Recommended Actions

- Evacuate
- Islanded
- Monitor
- No Action
- Sandbag
- Buildings (outside of flood zone)

Floodplain classifcations

- Road cut
- Low Flood Island
- High Flood Island
- Low Trapped Perimeter
- Overland escape route (OER)
- Rising road access from area (RRA)

Community places

- BoM - Flood gauge
- Community centres
- Ambulance / Police / Fire
- Nearby Safer Place / SES

Other mapping layers

- LIST State Cadastre
- Contours (major / minor)
- Major Roads
- Vehicular Track
- Watercourse
- Flood Plain / Wetland
- Huon River and main waterways

Scale 0 125 250 500 m

1:12,500 @ A3 GDA 1994 MGA Zone 55

Locality map

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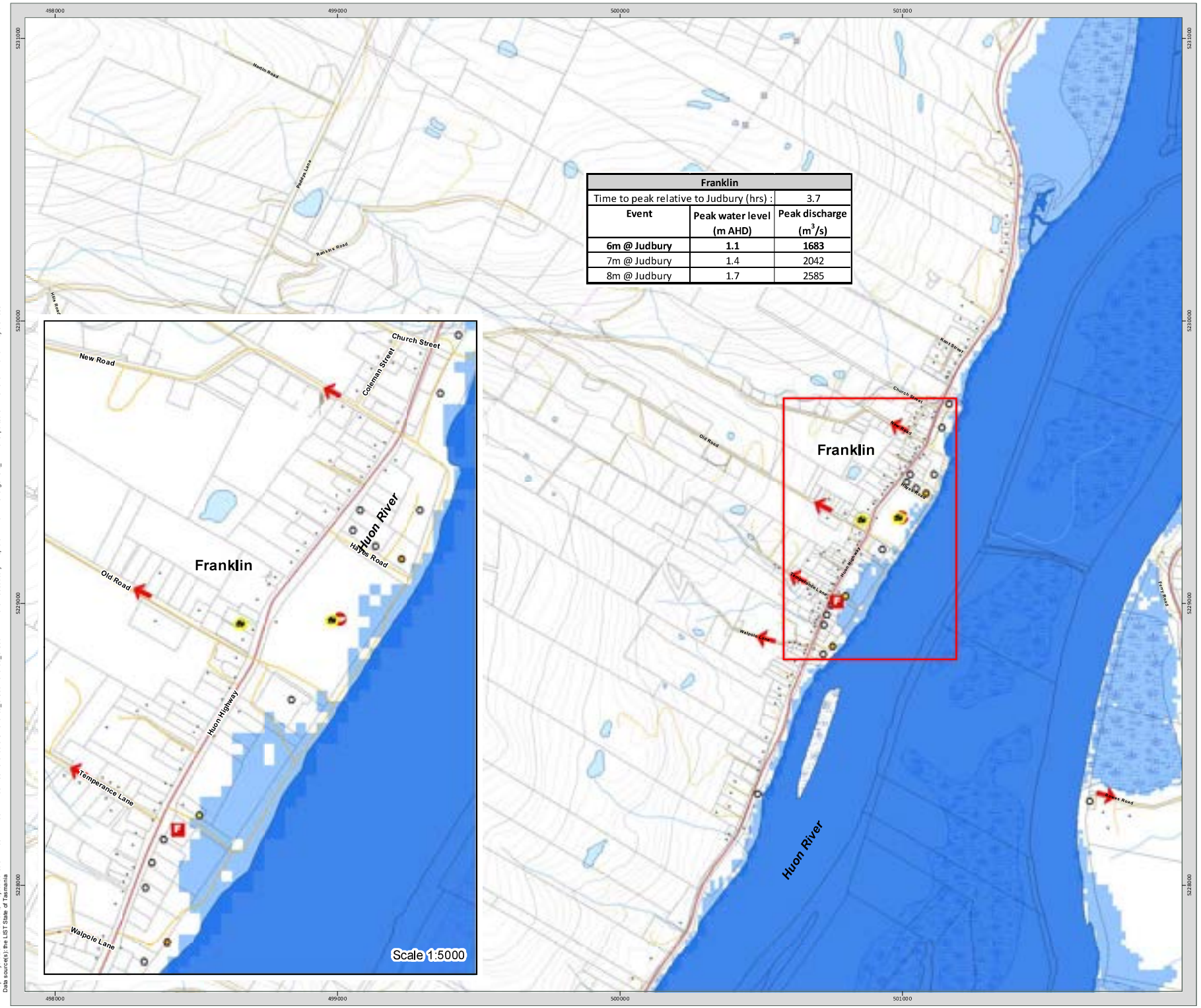

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Data source(s): the LIST State of Tasmania

Title	Huon River Flood Evacuation Plan 6.0m at Judbury Flood Gauge Franklin Enlargement
Client	Huon Valley Council
Map no.	E304700-P510490-GIS03-0
Date	26/07/2016
Drawn	S.Thomas
Reviewed	A.Jokanovic
Approved	Craig Ludlow

Legend

Area Inundated

Recommended Actions

- Evacuate
- Islanded
- Monitor
- No Action
- Sandbag
- Buildings (outside of flood zone)

Floodplain classifcations

- Road cut
- Low Flood Island
- High Flood Island
- Low Trapped Perimeter
- Overland escape route (OER)
- Rising road access from area (RRA)

Community places

- BoM - Flood gauge
- Community centres
- Ambulance / Police / Fire
- Nearby Safer Place / SES

Other mapping layers

- LIST State Cadastre
- Contours (major / minor)
- Major Roads
- Vehicular Track
- Watercourse
- Flood Plain / Wetland
- Huon River and main waterways

Scale 0 125 250 500 m

1:12,500 @ A3 GDA 1994 MGA Zone 55

Locality map

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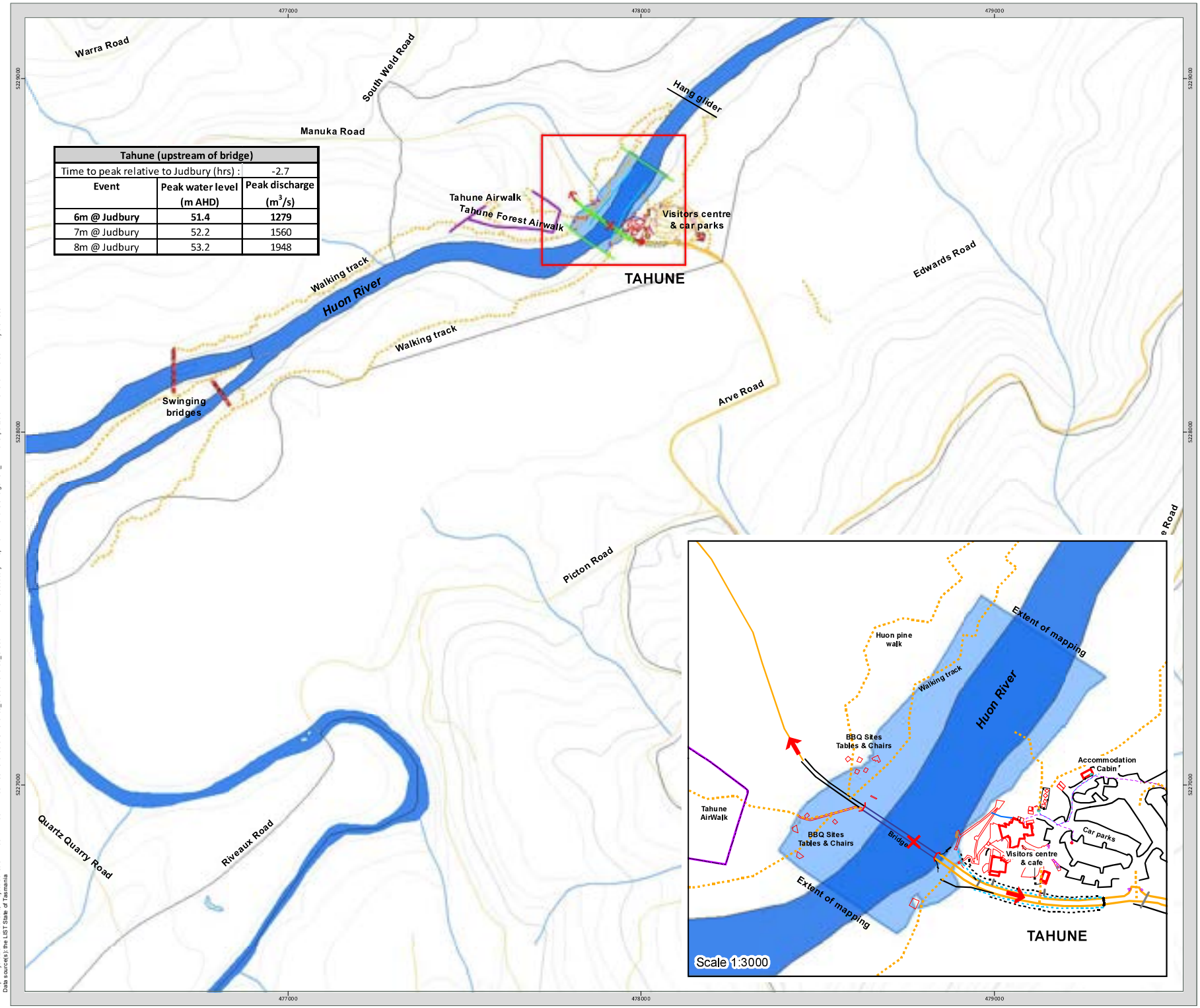
Tahune (upstream of bridge)		
Time to peak relative to Judbury (hrs) :		-2.7
Event	Peak water level (m AHD)	Peak discharge (m^3/s)
6m @ Judbury	51.4	1279
7m @ Judbury	52.2	1560
8m @ Judbury	53.2	1948



Title	Huon River Flood Evacuation Plan 6.0m at Judbury Flood Gauge Tahune
Client	Huon Valley Council
Map no.	E304700-P510490-GIS03-0
Date	26/07/2016
Drawn	S.Thomas
Reviewed	A.Jokanovic
Approved	Craig Ludlow

Legend

Area Inundated

Recommended Actions

- Evacuate
- Islanded
- Monitor
- No Action
- Sandbag
- Buildings (outside of flood zone)

Floodplain classifcations

- Road cut
- Low Flood Island
- High Flood Island
- Low Trapped Perimeter
- Overland escape route (OER)
- Rising road access from area (RRA)

Community places

- BoM - Flood gauge
- Community centres
- Ambulance / Police / Fire
- Nearby Safer Place / SES

Other mapping layers

- LIST State Cadastre
- Contours (major / minor)
- Major Roads
- Vehicular Track
- Watercourse
- Flood Plain / Wetland
- Huon River and main waterways

Scale 0 100 200 400 m

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Locality map

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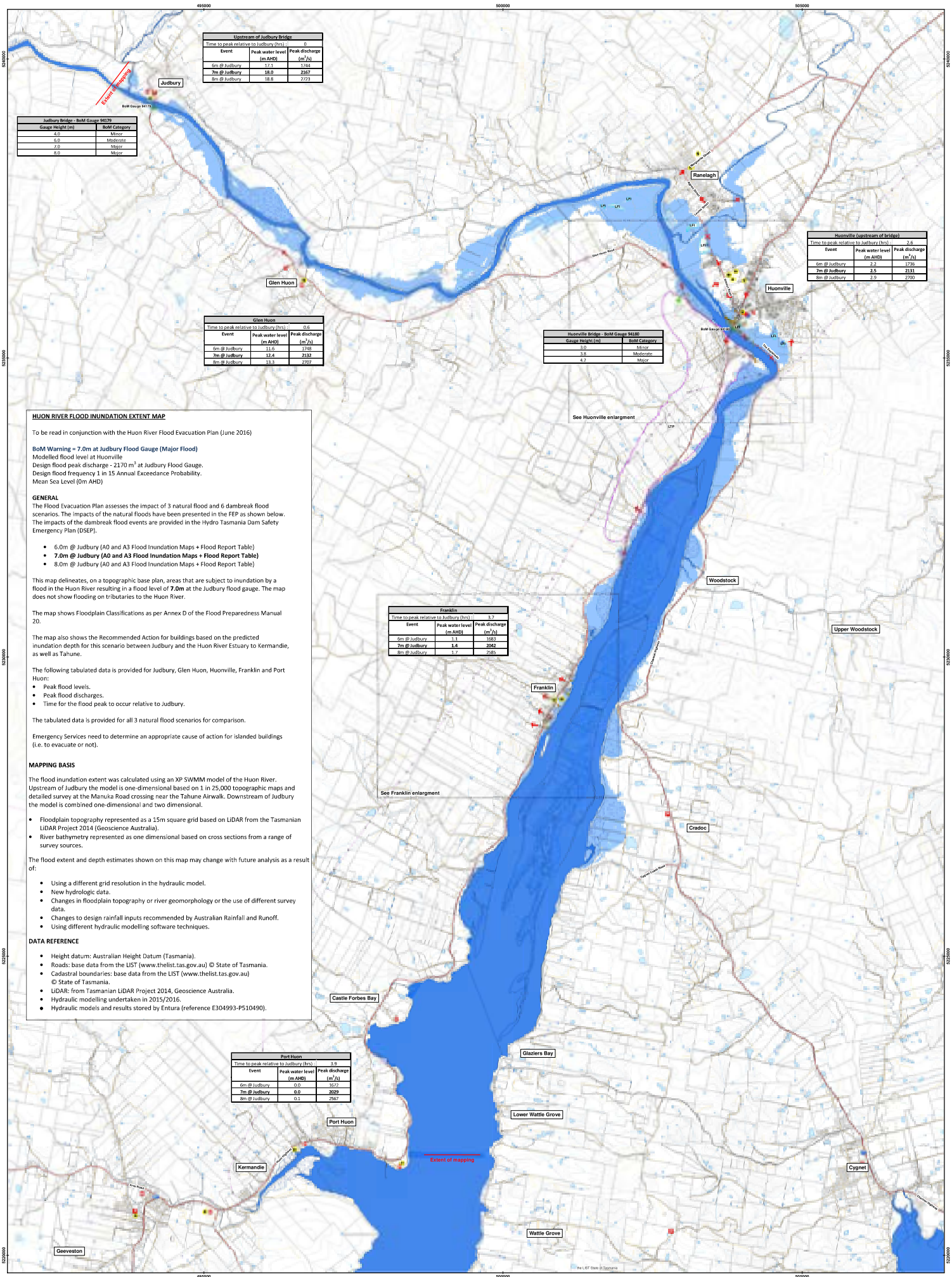

HUON RIVER FLOOD INUNDATION EXTENT MAP

To be read in conjunction with the Huon River Flood Evacuation Plan (June 2016)

BoM Warning = 7.0m at Judbury Flood Gauge (Major Flood)
Modelled flood level at Huonville
Design flood peak discharge - 2170 m^3 at Judbury Flood Gauge.
Design flood frequency 1 in 15 Annual Exceedance Probability.
Mean Sea Level (0m AHD)

GENERAL

The Flood Evacuation Plan assesses the impact of 3 natural flood and 6 dambreak flood scenarios. The impacts of the natural floods have been presented in the FEP as shown below. The impacts of the dambreak flood events are provided in the Hydro Tasmania Dam Safety Emergency Plan (DSEP).

- 6.0m @ Judbury (A0 and A3 Flood Inundation Maps + Flood Report Table)
- **7.0m @ Judbury (A0 and A3 Flood Inundation Maps + Flood Report Table)**
- 8.0m @ Judbury (A0 and A3 Flood Inundation Maps + Flood Report Table)

This map delineates, on a topographic base plan, areas that are subject to inundation by a flood in the Huon River resulting in a flood level of **7.0m** at the Judbury flood gauge. The map does not show flooding on tributaries to the Huon River.

The map shows Floodplain Classifications as per Annex D of the Flood Preparedness Manual 20.

The map also shows the Recommended Action for buildings based on the predicted inundation depth for this scenario between Judbury and the Huon River Estuary to Kermandie, as well as Tahune.

The following tabulated data is provided for Judbury, Glen Huon, Huonville, Franklin and Port Huon:

- Peak flood levels.
- Peak flood discharges.
- Time for the flood peak to occur relative to Judbury.

The tabulated data is provided for all 3 natural flood scenarios for comparison.

Emergency Services need to determine an appropriate cause of action for islanded buildings (i.e. to evacuate or not).

MAPPING BASIS

The flood inundation extent was calculated using an XP SWMM model of the Huon River. Upstream of Judbury the model is one-dimensional based on 1 in 25,000 topographic maps and detailed survey at the Manuka Road crossing near the Tahune Airwalk. Downstream of Judbury the model is combined one-dimensional and two dimensional.

- Floodplain topography represented as a 15m square grid based on LiDAR from the Tasmanian LiDAR Project 2014 (Geoscience Australia).
- River bathymetry represented as one dimensional based on cross sections from a range of survey sources.

The flood extent and depth estimates shown on this map may change with future analysis as a result of:

- Using a different grid resolution in the hydraulic model.
- New hydrologic data.
- Changes in floodplain topography or river geomorphology or the use of different survey data.
- Changes to design rainfall inputs recommended by Australian Rainfall and Runoff.
- Using different hydraulic modelling software techniques.

DATA REFERENCE

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- Roads: base data from the LIST (www.thelist.tas.gov.au) © State of Tasmania.
- Cadastral boundaries: base data from the LIST (www.thelist.tas.gov.au) © State of Tasmania.
- LiDAR: from Tasmanian LiDAR Project 2014, Geoscience Australia.
- Hydraulic modelling undertaken in 2015/2016.
- Hydraulic models and results stored by Entura (reference E304993-P510490).

Recommended Actions
- Evacuate
- Islanded
- Monitor
- No Action
- Sandbag
- Buildings (outside of flood zone)

Community places
- BoM - Flood gauge
- Community centres
- Ambulance
- Police
- Fire
- Nearby Safer Place
- SES

Floodplain classifications
- Road cut
- LFI: Low Flood Island
- HFI: High Flood Island
- LTP: Low Trapped Perimeter
- Overland escape route (OER)
- Rising road access from area (RRA)

Other mapping layers
- LIST State Cadastre
- Contours (major / minor)
- Major Roads
- Other Roads
- Vehicular Track
- Watercourse
- Flood Plain / Wetland
- Huon River and main waterways

Title	Huon River Flood Evacuation Plan 7.0m at Judbury Flood Gauge
Client	Huon Valley Council
Map no.	E304700-P510490-GIS03-0
Date	26/07/2016
Drawn	S.Thomas
Reviewed	A.Jokanovic
Approved	Craig Ludlow

N W E S

SCALE: 1:20,000

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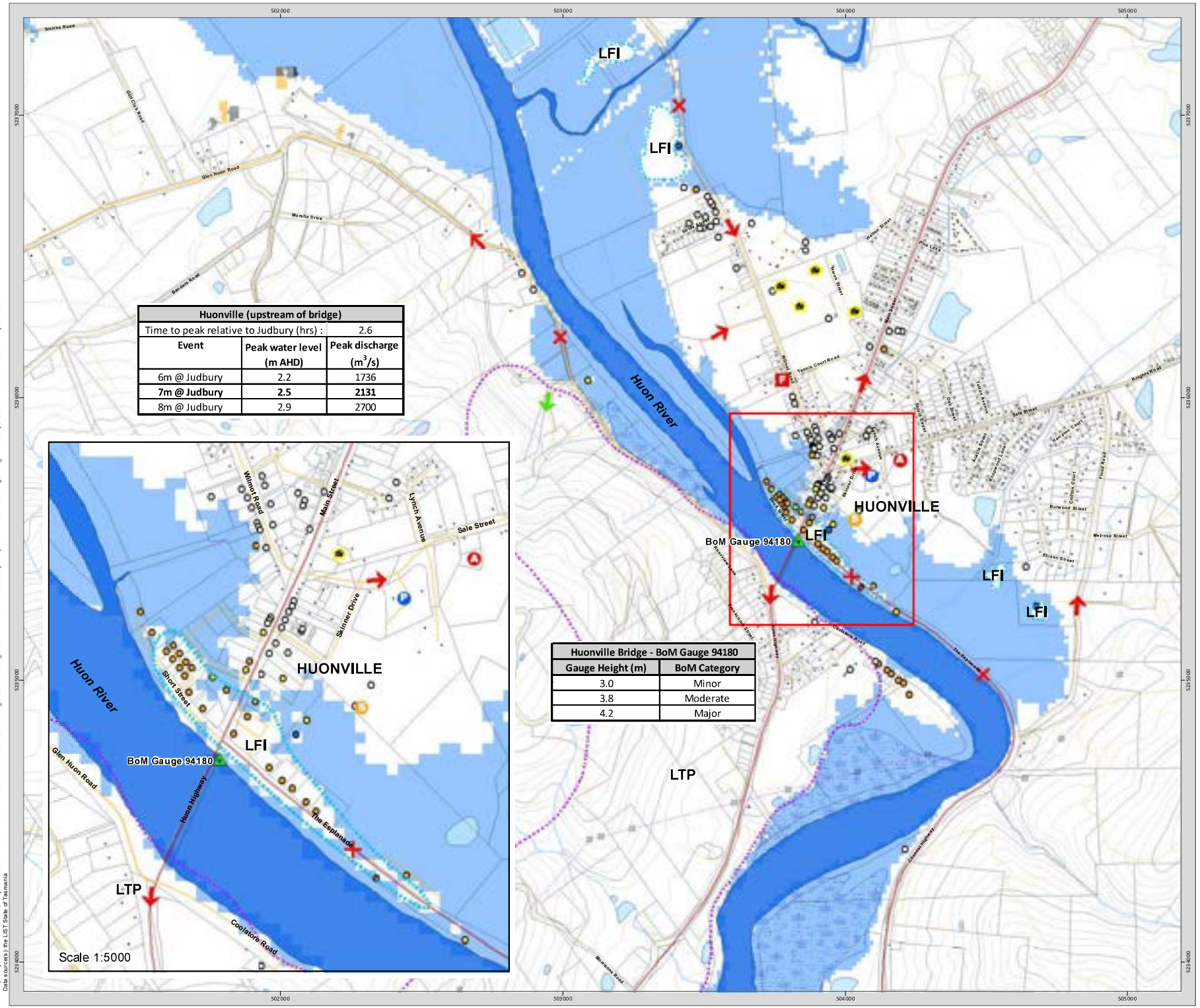


Huonville (upstream of bridge)		
Time to peak relative to Judbury (hrs) :		2.6
Event	Peak water level (m AHD)	Peak discharge (m^3/s)
6m @ Judbury	2.2	1736
7m @ Judbury	**2.5**	**2131**
8m @ Judbury	2.9	2700

Huonville Bridge - BoM Gauge 94180	
Gauge Height (m)	BoM Category
3.0	Minor
3.8	Moderate
4.2	Major

Title: Huon River Flood Evacuation Plan
7.0m at Judbury Flood Gauge
Huonville Enlargement

Client	Huon Valley Council
Map no.	E304700-P510490-GIS03-0
Date	25/07/2016
Drawn	S.Thomas
Reviewed	A.Jokanovic
Approved	Craig Ludlow

Legend

Area Inundated

Recommended Actions

- Evacuate
- Islanded
- Monitor
- No Action
- Sandbag
- Buildings (outside of flood zone)

Floodplain classifcations

- Road cut
- Low Flood Island
- High Flood Island
- Low Trapped Perimeter
- Overland escape route (OER)
- Rising road access from area (RRA)

Community places

- BoM - Flood gauge
- Community centres
- Ambulance / Police / Fire
- Nearby Safer Place / SES

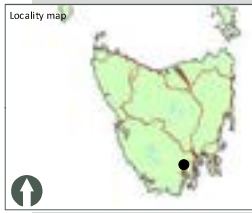
Other mapping layers

- LIST State Cadastre
- Contours (major / minor)
- Major Roads
- Vehicular Track
- Watercourse
- Flood Plain / Wetland
- Huon River and main waterways

Scale: 0 125 250 500 m

1:12,500 @ A3 GDA 1994 MGA Zone 55

Locality map



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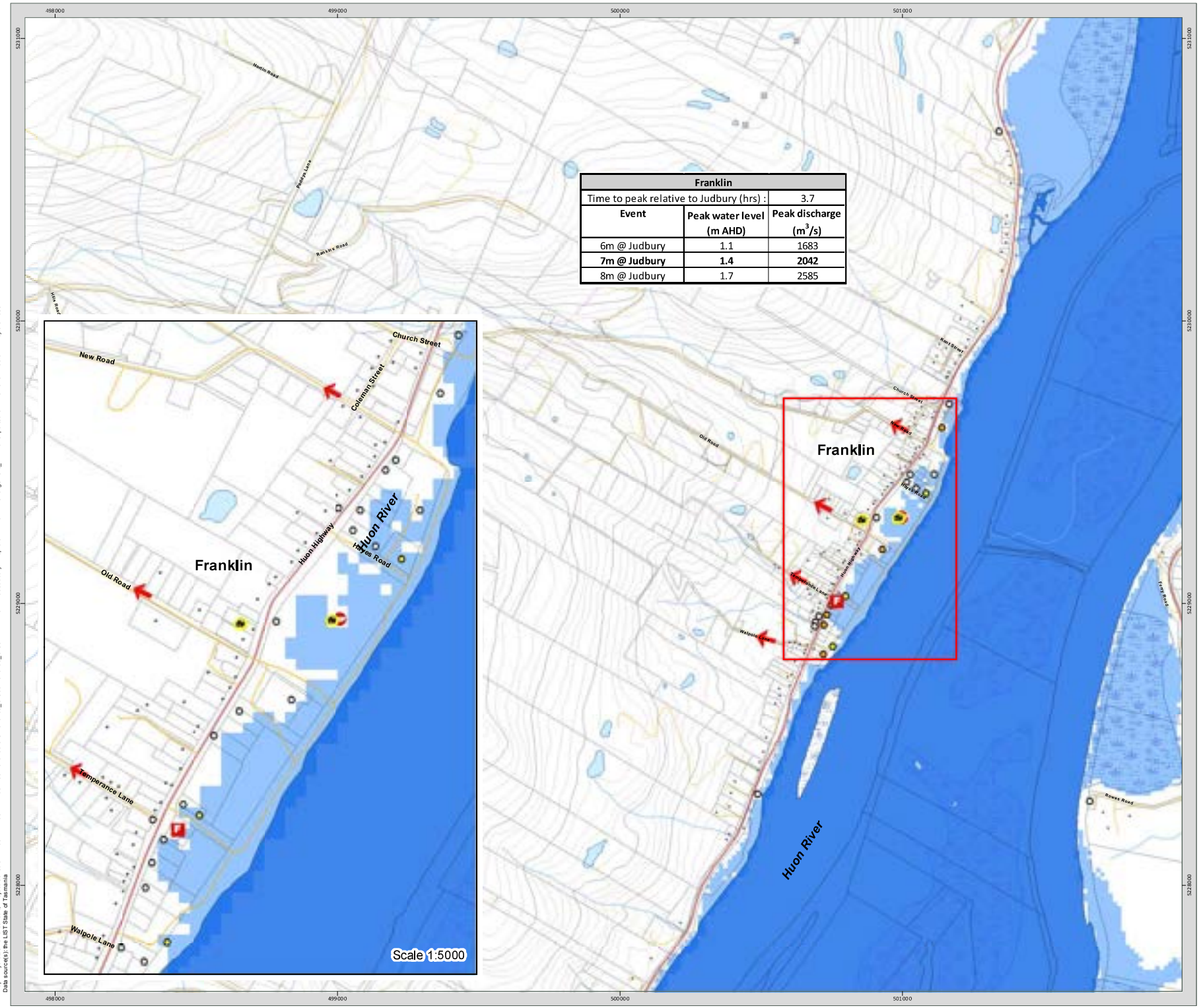

Map: "I:\hydrotasmania\consult$\Project\Consult\ME304xxx\E304700\P510490\GIS\P510490_GIS03\P510490_GIS03 - FEP with 7m at Judbury - Map 3 of 4 - Franklin enlargement_v4.mxd" exported on 7/26/2016 12:50:57 PM by thomass
Data source(s): the LIST State of Tasmania

Title: Huon River Flood Evacuation Plan 7.0m at Judbury Flood Gauge Franklin Enlargement

Client	Huon Valley Council
Map no.	E304700-P510490-GIS03-0
Date	26/07/2016
Drawn	S.Thomas
Reviewed	A.Jokanovic
Approved	Craig Ludlow

Legend

Area Inundated

Recommended Actions

- Evacuate
- Islanded
- Monitor
- No Action
- Sandbag
- Buildings (outside of flood zone)

Floodplain classifcations

- Road cut
- Low Flood Island
- High Flood Island
- Low Trapped Perimeter
- Overland escape route (OER)
- Rising road access from area (RRA)

Community places

- BoM - Flood gauge
- Community centres
- Ambulance / Police / Fire
- Nearby Safer Place / SES

Other mapping layers

- LIST State Cadastre
- Contours (major / minor)
- Major Roads
- Vehicular Track
- Watercourse
- Flood Plain / Wetland
- Huon River and main waterways

Scale 0 125 250 500 m

1:12,500 @ A3 GDA 1994 MGA Zone 55

Locality map

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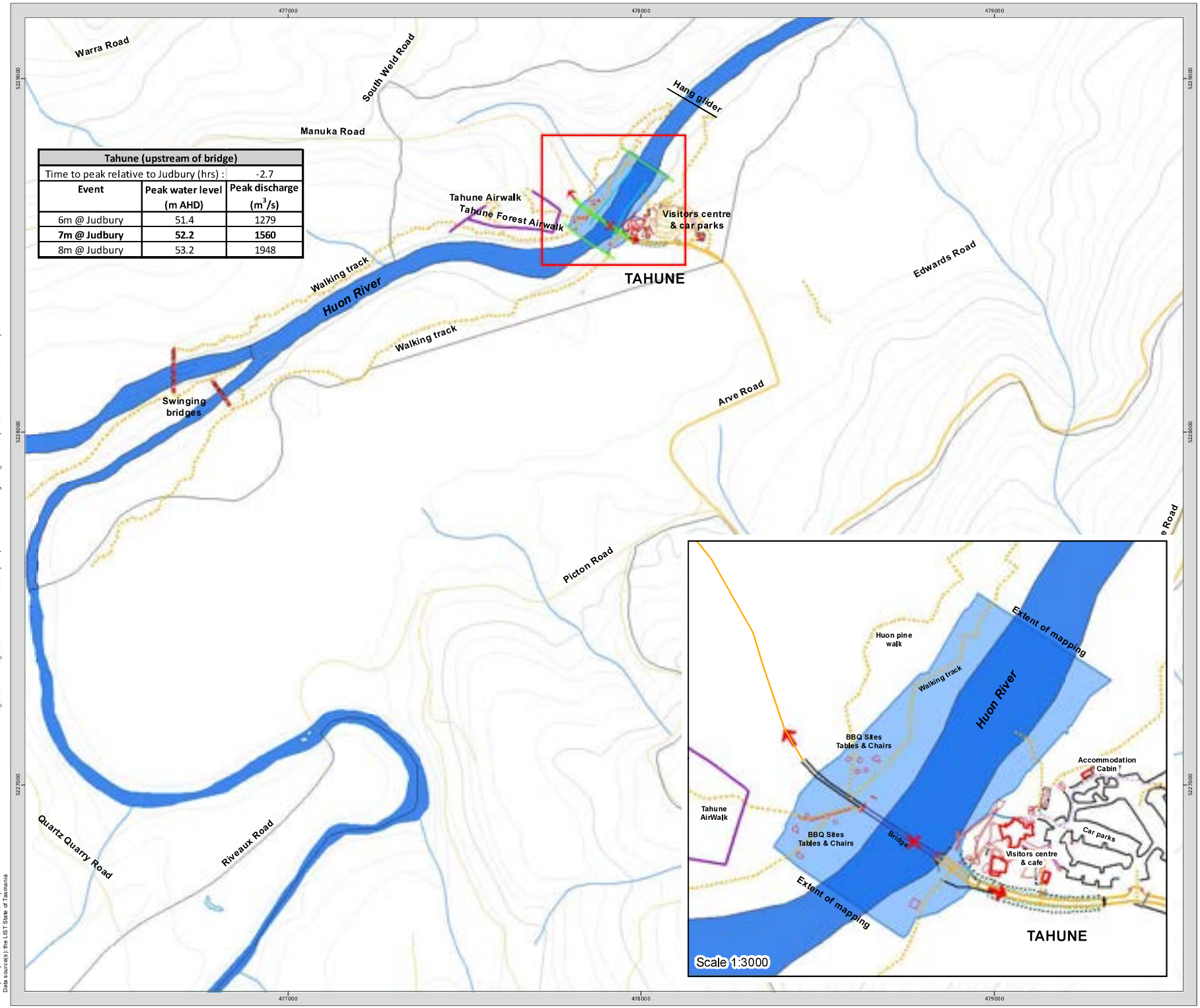
Tahune (upstream of bridge)		
Time to peak relative to Judbury (hrs) :		-2.7
Event	**Peak water level (m AHD)**	**Peak discharge (m^3/s)**
6m @ Judbury	51.4	1279
7m @ Judbury	**52.2**	**1560**
8m @ Judbury	53.2	1948



Title	Huon River Flood Evacuation Plan 7.0m at Judbury Flood Gauge Tahune
Client	Huon Valley Council
Map no.	E304700-P510490-GIS03-0
Date	25/07/2016
Drawn	S.Thomas
Reviewed	A.Jokanovic
Approved	Craig Ludlow

Legend

Area Inundated

Recommended Actions

- Evacuate
- No Action
- Islanded
- Sandbag
- Monitor
- Buildings (outside of flood zone)

Floodplain classifcations

- Road cut
- Low Flood Island
- High Flood Island
- Low Trapped Perimeter
- Overland escape route (OER)
- Rising road access from area (RRA)

Community places

- BoM - Flood gauge
- Community centres
- Ambulance / Police / Fire
- Nearby Safer Place / SES

Other mapping layers

- LIST State Cadastre
- Contours (major / minor)
- Major Roads
- Vehicular Track
- Watercourse
- Flood Plain / Wetland
- Huon River and main waterways

Scale 0 100 200 400 m

1:10,000 @ A3 GDA 1994 MGA Zone 55

Locality map

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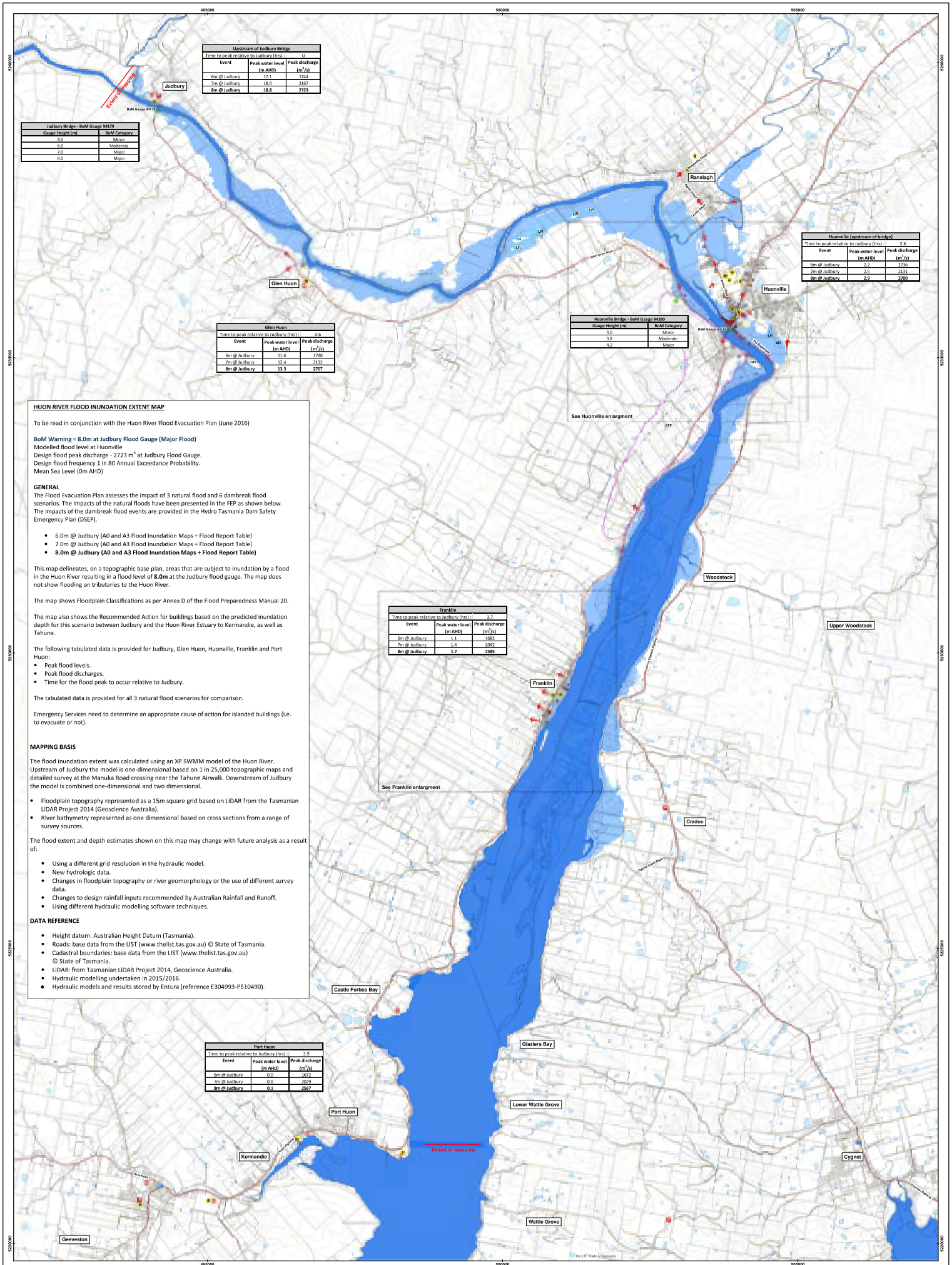

Upstream of Judbury Bridge	
Time to peak relative to Judbury (hrs)	0
Event	Peak water level (m AHD) / Peak discharge (m^3/s)
6m @ Judbury	17.1 / 1744
7m @ Judbury	18.0 / 2167
8m @ Judbury	**18.8 / 2723**

Judbury Bridge - BoM Gauge 94179	
Gauge Height (m)	BoM Category
4.0	Minor
6.0	Moderate
7.0	Major
8.0	Major

Glen Huon	
Time to peak relative to Judbury (hrs)	0.6
Event	Peak water level (m AHD) / Peak discharge (m^3/s)
6m @ Judbury	11.6 / 1768
7m @ Judbury	12.4 / 2132
8m @ Judbury	**13.3 / 2707**

Huonville (upstream of bridge)	
Time to peak relative to Judbury (hrs)	2.6
Event	Peak water level (m AHD) / Peak discharge (m^3/s)
6m @ Judbury	2.2 / 1736
7m @ Judbury	2.5 / 2131
8m @ Judbury	**2.9 / 2700**

Huonville Bridge - BoM Gauge 94180	
Gauge Height (m)	BoM Category
3.0	Minor
3.8	Moderate
4.2	Major

Franklin	
Time to peak relative to Judbury (hrs)	3.7
Event	Peak water level (m AHD) / Peak discharge (m^3/s)
6m @ Judbury	1.1 / 1683
7m @ Judbury	1.4 / 2042
8m @ Judbury	**1.7 / 2585**

Port Huon	
Time to peak relative to Judbury (hrs)	3.9
Event	Peak water level (m AHD) / Peak discharge (m^3/s)
6m @ Judbury	0.0 / 1672
7m @ Judbury	0.0 / 2029
8m @ Judbury	**0.1 / 2567**

HUON RIVER FLOOD INUNDATION EXTENT MAP

To be read in conjunction with the Huon River Flood Evacuation Plan (June 2016)

BoM Warning = 8.0m at Judbury Flood Gauge (Major Flood)
Modelled flood level at Huonville
Design flood peak discharge - 2723 m^3 at Judbury Flood Gauge.
Design flood frequency 1 in 80 Annual Exceedance Probability.
Mean Sea Level (0m AHD)

GENERAL

The Flood Evacuation Plan assesses the impact of 3 natural flood and 6 dambreak flood scenarios. The impacts of the natural floods have been presented in the FEP as shown below. The impacts of the dambreak flood events are provided in the Hydro Tasmania Dam Safety Emergency Plan (DSEP).

- 6.0m @ Judbury (A0 and A3 Flood Inundation Maps + Flood Report Table)
- 7.0m @ Judbury (A0 and A3 Flood Inundation Maps + Flood Report Table)
- **8.0m @ Judbury (A0 and A3 Flood Inundation Maps + Flood Report Table)**

This map delineates, on a topographic base plan, areas that are subject to inundation by a flood in the Huon River resulting in a flood level of **8.0m** at the Judbury flood gauge. The map does not show flooding on tributaries to the Huon River.

The map shows Floodplain Classifications as per Annex D of the Flood Preparedness Manual 20.

The map also shows the Recommended Action for buildings based on the predicted inundation depth for this scenario between Judbury and the Huon River Estuary to Kermandie, as well as Tahune.

The following tabulated data is provided for Judbury, Glen Huon, Huonville, Franklin and Port Huon:

- Peak flood levels.
- Peak flood discharges.
- Time for the flood peak to occur relative to Judbury.

The tabulated data is provided for all 3 natural flood scenarios for comparison.

Emergency Services need to determine an appropriate cause of action for islanded buildings (i.e. to evacuate or not).

MAPPING BASIS

The flood inundation extent was calculated using an XP SWMM model of the Huon River. Upstream of Judbury the model is one-dimensional based on 1 in 25,000 topographic maps and detailed survey at the Manuka Road crossing near the Tahune Airwalk. Downstream of Judbury the model is combined one-dimensional and two dimensional.

- Floodplain topography represented as a 15m square grid based on LiDAR from the Tasmanian LiDAR Project 2014 (Geoscience Australia).
- River bathymetry represented as one dimensional based on cross sections from a range of survey sources.

The flood extent and depth estimates shown on this map may change with future analysis as a result of:

- Using a different grid resolution in the hydraulic model.
- New hydrologic data.
- Changes in floodplain topography or river geomorphology or the use of different survey data.
- Changes to design rainfall inputs recommended by Australian Rainfall and Runoff.
- Using different hydraulic modelling software techniques.

DATA REFERENCE

- Height datum: Australian Height Datum (Tasmania).
- Roads: base data from the LIST (www.thelist.tas.gov.au) © State of Tasmania.
- Cadastral boundaries: base data from the LIST (www.thelist.tas.gov.au) © State of Tasmania.
- LIDAR: from Tasmanian LiDAR Project 2014, Geoscience Australia.
- Hydraulic modelling undertaken in 2015/2016.
- Hydraulic models and results stored by Entura (reference E304993-P510490).

Recommended Actions
- Evacuate
- Islanded
- Monitor
- No Action
- Sandbag
- Buildings (outside of flood zone)

Community places
- BoM - Flood gauge
- Community centres
- Ambulance
- Police
- Fire
- Nearby Safer Place
- SES

Floodplain classifications
- Road cut
- LFI Low Flood Island
- HFI High Flood Island
- LTP Low Trapped Perimeter
- Overland escape route (OER)
- Rising road access from area (RRA)

Other mapping layers
- LIST State Cadastre
- Contours (major / minor)
- Major Roads
- Other Roads
- Vehicular Track
- Watercourse
- Flood Plain / Wetland
- Huon River and main waterways

Title	Huon River Flood Evacuation Plan 8.0m at Judbury Flood Gauge
Client	Huon Valley Council
Map no.	E304700-P510490-GIS03-0
Date	25/07/2016
Drawn	S.Thomas
Reviewed	A.Jokanovic
Approved	Craig Ludlow

SCALE: 1:20,000
0 1 2 3 km

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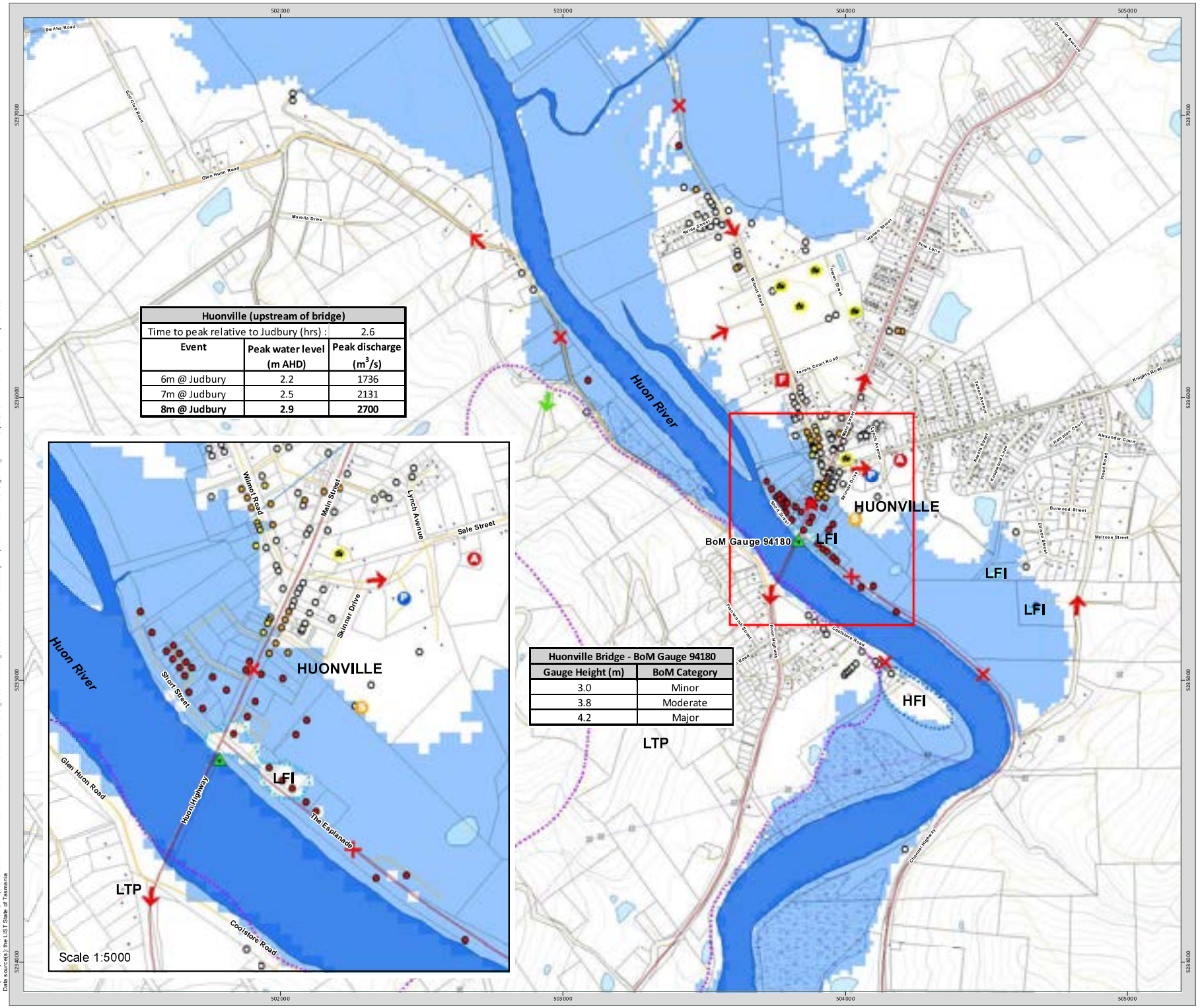

Title	Huon River Flood Evacuation Plan 8.0m at Judbury Flood Gauge Huonville Enlargement
Client	Huon Valley Council
Map no.	E304700-P510490-GIS03-0
Date	01/07/2016
Drawn	S.Thomas
Reviewed	A.Jokanovic
Approved	Craig Ludlow

Legend

Area Inundated

Recommended Actions

- Evacuate
- Islanded
- Monitor
- No Action
- Sandbag
- Buildings (outside of flood zone)

Floodplain classifcations

- Road cut
- Low Flood Island
- High Flood Island
- Low Trapped Perimeter
- Overland escape route (OER)
- Rising road access from area (RRA)

Community places

- BoM - Flood gauge
- Community centres
- Ambulance / Police / Fire
- Nearby Safer Place / SES

Other mapping layers

- LIST State Cadastre
- Contours (major / minor)
- Major Roads
- Vehicular Track
- Watercourse
- Flood Plain / Wetland
- Huon River and main waterways

Scale 0 125 250 500 m

1:12,500 @ A3 GDA 1994 MGA Zone 55

Locality map

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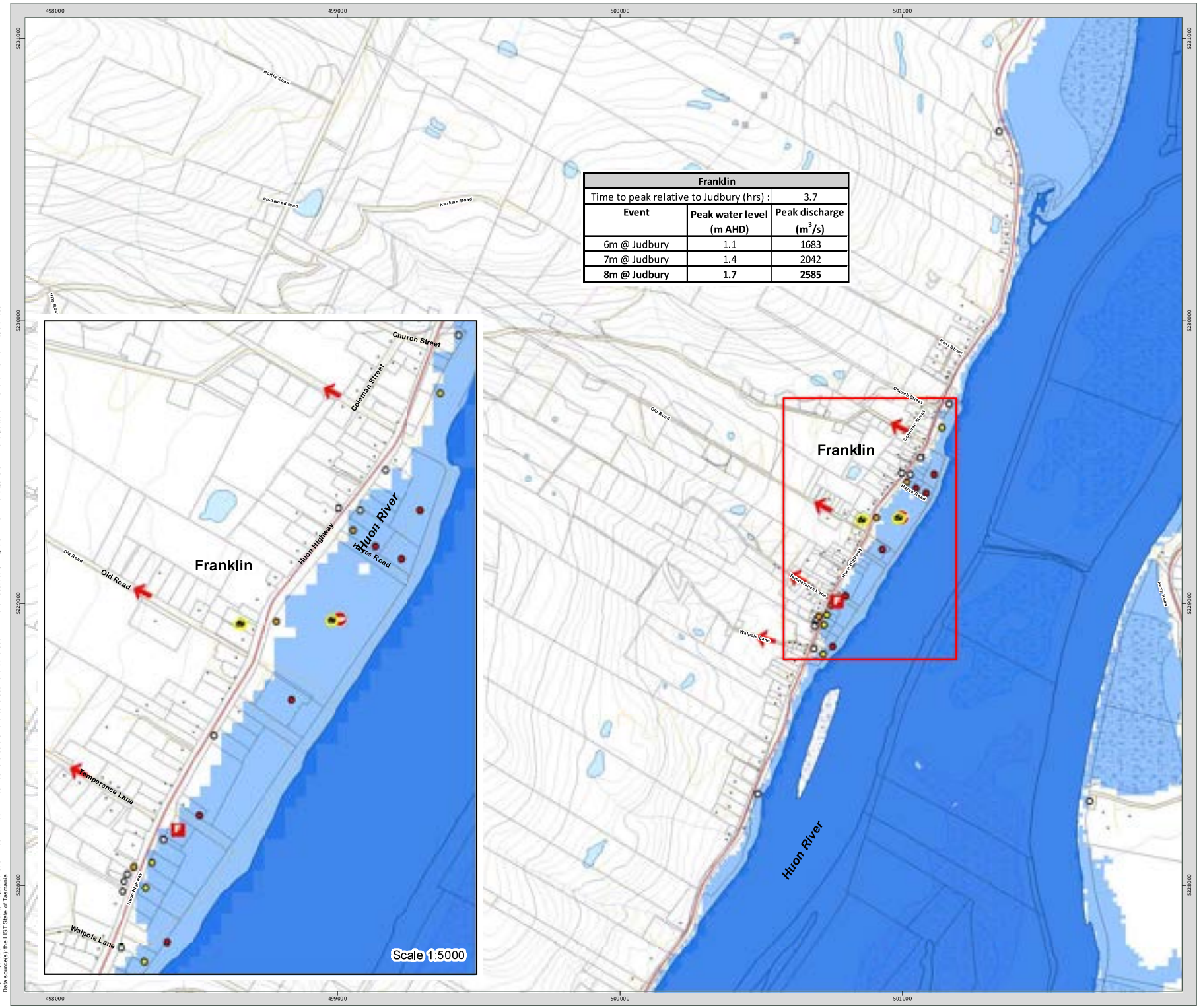

Title: Huon River Flood Evacuation Plan 8.0m at Judbury Flood Gauge Franklin Enlargement

Client	Huon Valley Council
Map no.	E304700-P510490-GIS03-0
Date	01/07/2016
Drawn	S.Thomas
Reviewed	A.Jokanovic
Approved	Craig Ludlow

Legend

Area Inundated

Recommended Actions

- Evacuate
- Islanded
- Monitor
- No Action
- Sandbag
- Buildings (outside of flood zone)

Floodplain classifcations

- Road cut
- Low Flood Island
- High Flood Island
- Low Trapped Perimeter
- Overland escape route (OER)
- Rising road access from area (RRA)

Community places

- BoM - Flood gauge
- Community centres
- Ambulance / Police / Fire
- Nearby Safer Place / SES

Other mapping layers

- LIST State Cadastre
- Contours (major / minor)
- Major Roads
- Vehicular Track
- Watercourse
- Flood Plain / Wetland
- Huon River and main waterways

Scale: 0 125 250 500 m

1:12,500 @ A3 GDA 1994 MGA Zone 55

Locality map

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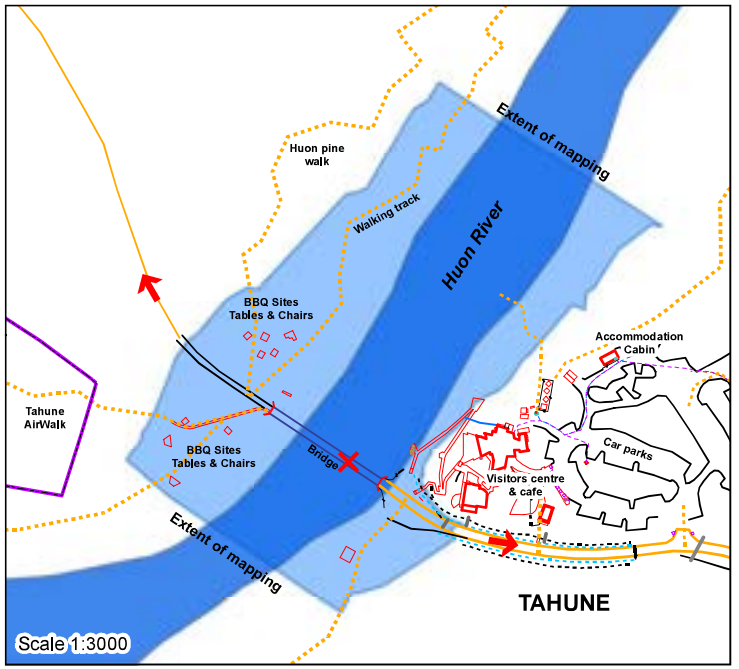
Tahune (upstream of bridge)		
Time to peak relative to Judbury (hrs) :		-2.7
Event	**Peak water level (m AHD)**	**Peak discharge (m^3/s)**
6m @ Judbury	51.4	1279
7m @ Judbury	52.2	1560
8m @ Judbury	**53.2**	**1948**



Huon River Flood Evacuation Plan 8.0m at Judbury Flood Gauge Tahune

Client	Huon Valley Council
Map no.	E304700-P510490-GIS03-0
Date	02/08/2016
Drawn	S.Thomas
Reviewed	A.Jokanovic
Approved	Craig Ludlow

Legend

Area Inundated

Recommended Actions

- Evacuate
- Islanded
- Monitor
- No Action
- Sandbag
- Buildings (outside of flood zone)

Floodplain classifcations

- Road cut
- Low Flood Island
- High Flood Island
- Low Trapped Perimeter
- Overland escape route (OER)
- Rising road access from area (RRA)

Community places

- BoM - Flood gauge
- Community centres
- Ambulance / Police / Fire
- Nearby Safer Place / SES

Other mapping layers

- LIST State Cadastre
- Contours (major / minor)
- Major Roads
- Vehicular Track
- Watercourse
- Flood Plain / Wetland
- Huon River and main waterways

Scale 0 100 200 400 m

1:10,000 @ A3 GDA 1994 MGA Zone 55

Locality map

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E Flood reports

The flood reports provide details on:

- the modelled flood level;
- properties affected;
- the property locations by township and grid reference;
- the flood level below or above property floor levels;
- the actions to be taken to protect life and property;
- the flood level below or above roads and bridges.

The flood reports are designed to be a guide for actions to be taken for natural and a dam failure flood scenarios.

The actions are based on the following water levels relative to property floor levels and access road levels for islanded areas:

Buildings

- **No action** - water level is more than **0.4** metres **below** the floor of the property;
- **Monitor** - water level is between **0.4** metres and **0.1** metres **below** the floor of the property;
- **Sandbag** - water level is between **0.1** metres below and **0.3** metres **above** the floor of the property;
- **Evacuate** - water is more than **0.3** metres **above** the floor of the property.

Islanded areas

- **Monitor** - water level is **between 0** metres and **0.3** metres over the access road.
- **Evacuate** – water level is **greater** than **0.3** metres over the access road.

A safety margin will be included within the predicted level that is provided to the community in the warning. For example, the State Emergency Service in consultation with the Bureau of Meteorology will add a safety margin to the level prediction of 0.2 or 0.5 of a metre. This safety margin is to allow for:

- Potential errors in the prediction modelling.
- The effects of variations in flow velocities.
- The effects of inflow from the minor tributaries downstream of the Scotts Peak Dam.

The inclusion of water levels over roads and bridges is to enable the selection of evacuation routes and to identify when these routes will be impassable. For all sedan vehicles, 0.4m (16 inches) of water over a road will be sufficient to make any attempt to cross it very dangerous.

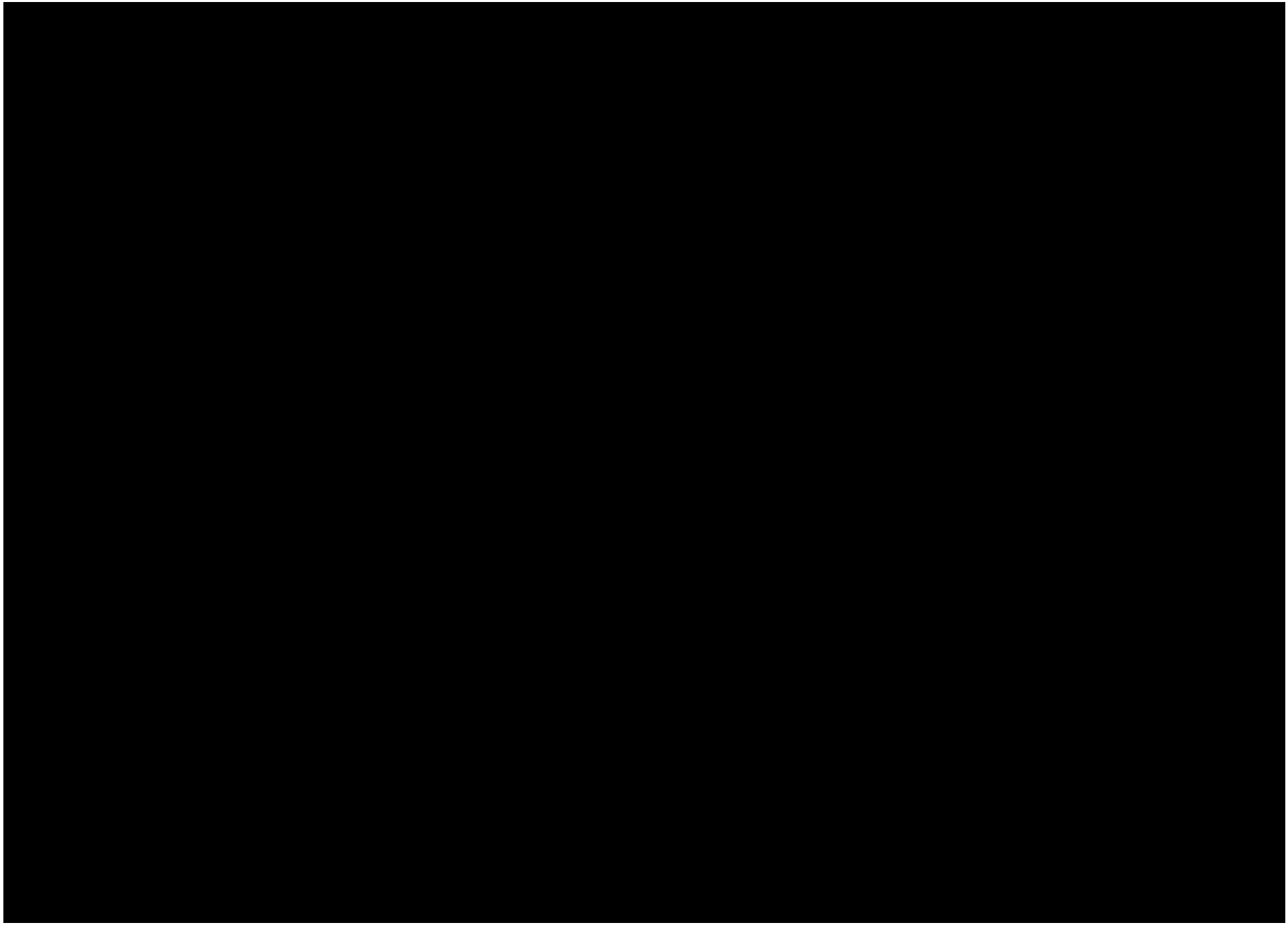
Flood report no.	Flood event	No of sheets
1	6.0m at Judbury	3
2	7.0m at Judbury	4
3	8.0m at Judbury	5
4	Scotts Peak Dam, Dam Crest Flood and dam failure	27
5	Scotts Peak Dam, Sunny Day Failure	22
6	Edgar Dam and Scotts Peak Dam, simultaneous Sunny Day Failure	22
7	Edgar Dam followed by Scotts Peak Dam, Sunny Day Failure	20
8	Scotts Peak East Saddle Dam, Sunny Day Failure	14
9	Edgar Dam, Sunny Day Failure	13

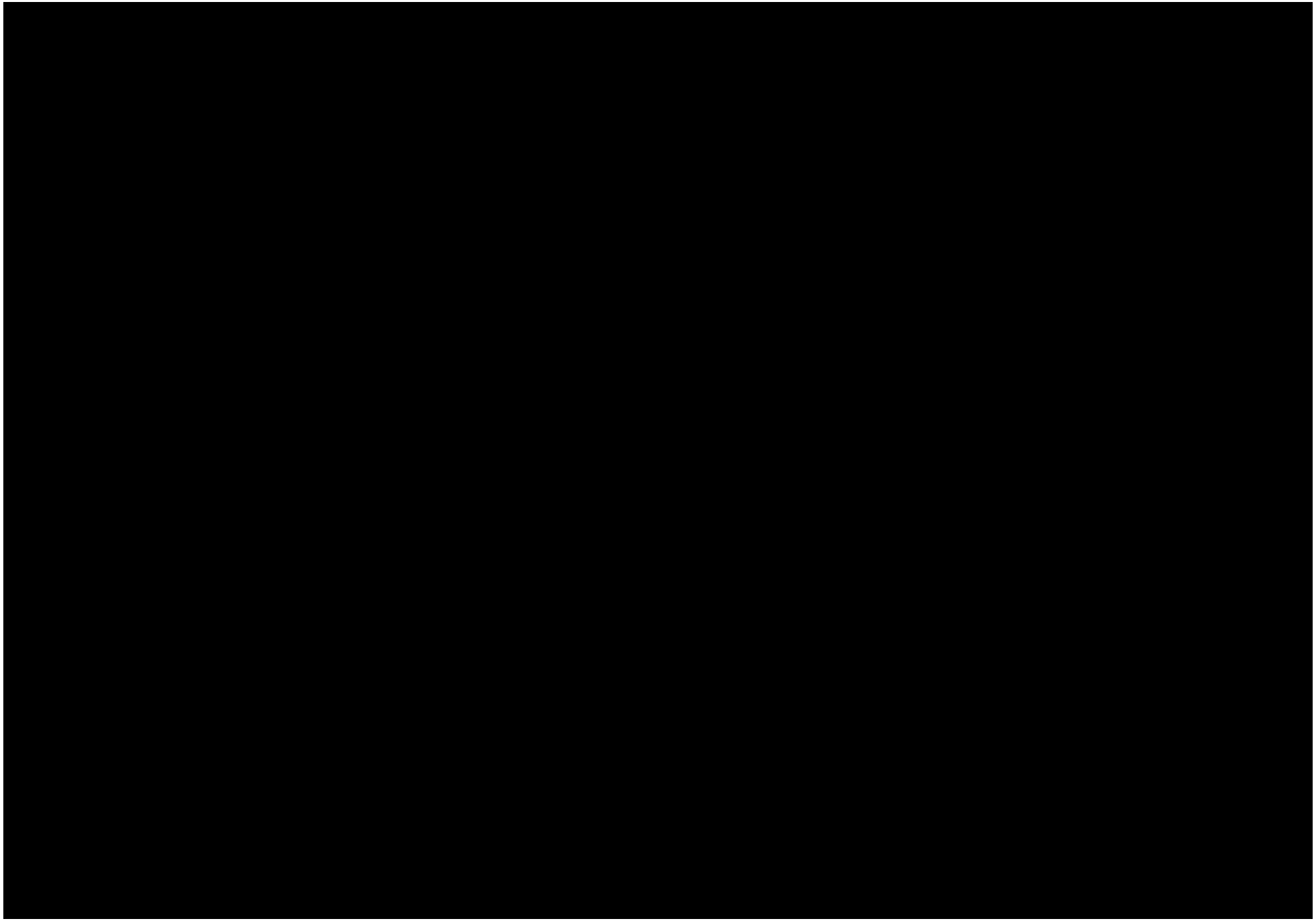
The flood reports listed in the table above show which residences, buildings, roads and bridges will be inundated for the modelled natural and dambreak flood events. The reports provide the following details for the properties and infrastructure concerned:

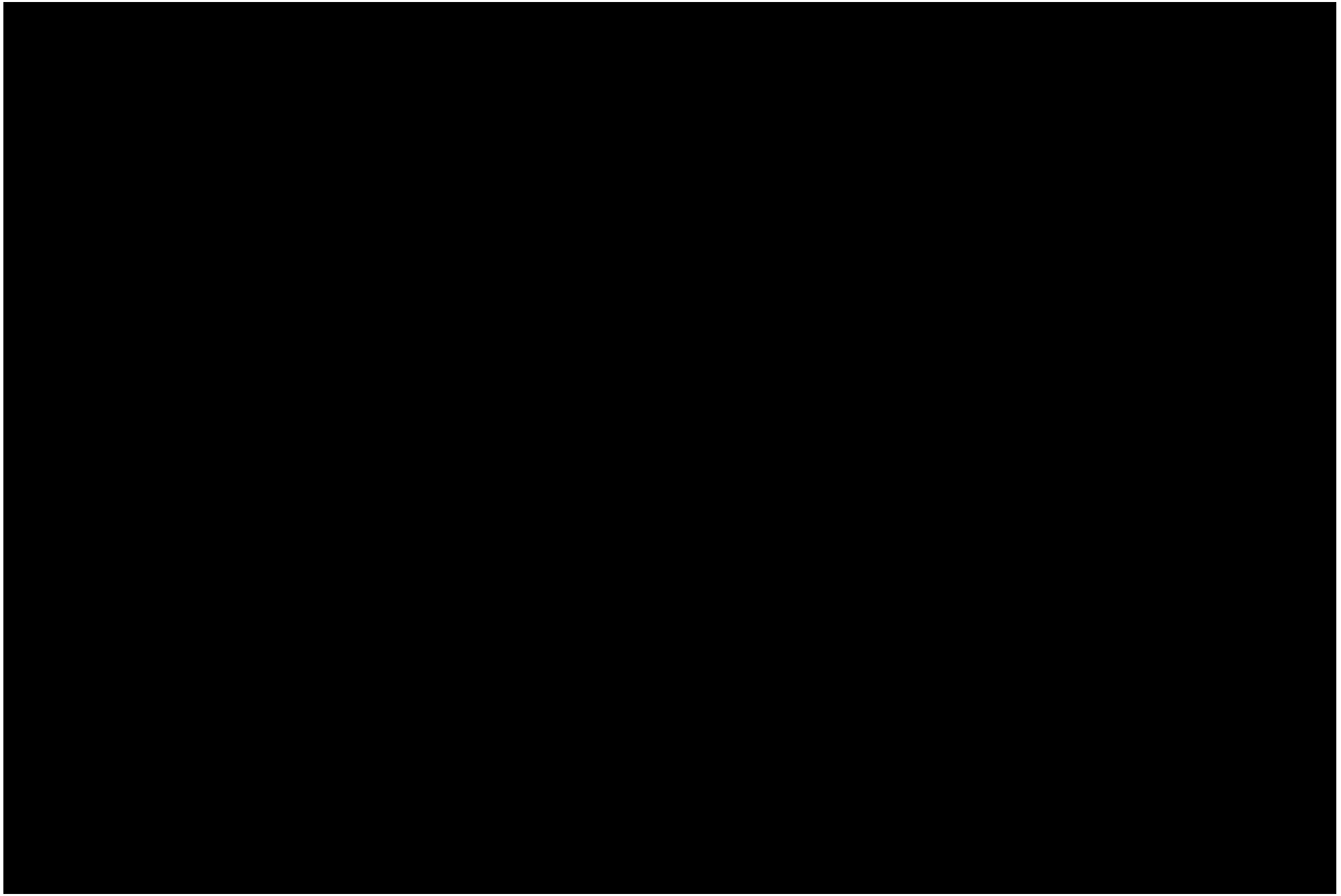
- Flood zone. The inundated areas are divided into 11 zones (A, B, C, D, E, F, G, H, I, J, K) as per Appendix C.
- Address of the residence or building.
- Easting and northing of the residence or building.
- Predicted flood level in m AHD.
- Floor level in m AHD) (or bridge or road level).
- Estimated flood depth in meters (positive value = flooded depth).
- Description of the dwelling or infrastructure.
- Suggested action for the flood event, e.g., ‘evacuate’, ‘sand bag’, etc.

The predicted flood levels are based on a XP SWMM flood analysis two-dimensional model of the Huon River. The model uses a series of river cross sections and digital elevation model (DEM) and calculates the predicted flood levels for particular flood hydrographs. Only the peak flood levels for each flood are recorded in the flood reports.

The flood reports show all properties currently expected to be within 1m (vertical) of the inundation zone. Future development within the Huon River system may increase the number of properties that could be affected by natural flood event scenarios and dam failure.







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FLOOD REPORT - NO.2

7.0m at the Judbury Flood Gauge and Mean Sea Level
Equivalent to BoM MAJOR flood
Peak discharge at Judbury: 2170m^3/s
HUON RIVER from JUDBURY to WATERLOO (Huon Estuary), including TAHUNE

	Maximum Flood Levels at Bridges	
	(m gauge)	(m AHD)
Tahune Bridge	7.4	52.2
Weld Rd Bridge		37.9
Judbury Bridge	7.1	18.0
Huonville Bridge	3.9	2.5

Notes
~ The flood levels have been estimated using XP SWMM software and are relative to the Australian Height Datum (m AHD).
~ Upstream of Judbury the XS WMM model is one-deimensional based on 1:25,000 topographic map contours.
~ Downstream of Judbury the XP SWMM model is a combined 1D/2D model with the floodplain based on LiDAR from Geoscience Australia and the river channel based on a variety of survey sources.
~ The flood event resulting in a level of 6.0m at the Judbury gauge is equivalent to a 1:4 AEP flood event.
~ Coordinates are MGA (Map Grid of Australia), Zone 55.
~ For zones, refer to Appendix C of the FEP.

~ Emergency services should check maps (e.g. Street Atlas) for nearby properties that may be affected.
~ Buildings floor levels greater than 1.0m above the predicted flood level are not included in this table.
~ Buildings that may be islanded, but not inundated have not been added to the tables.

Summary of flooded infrastructure

Bridges

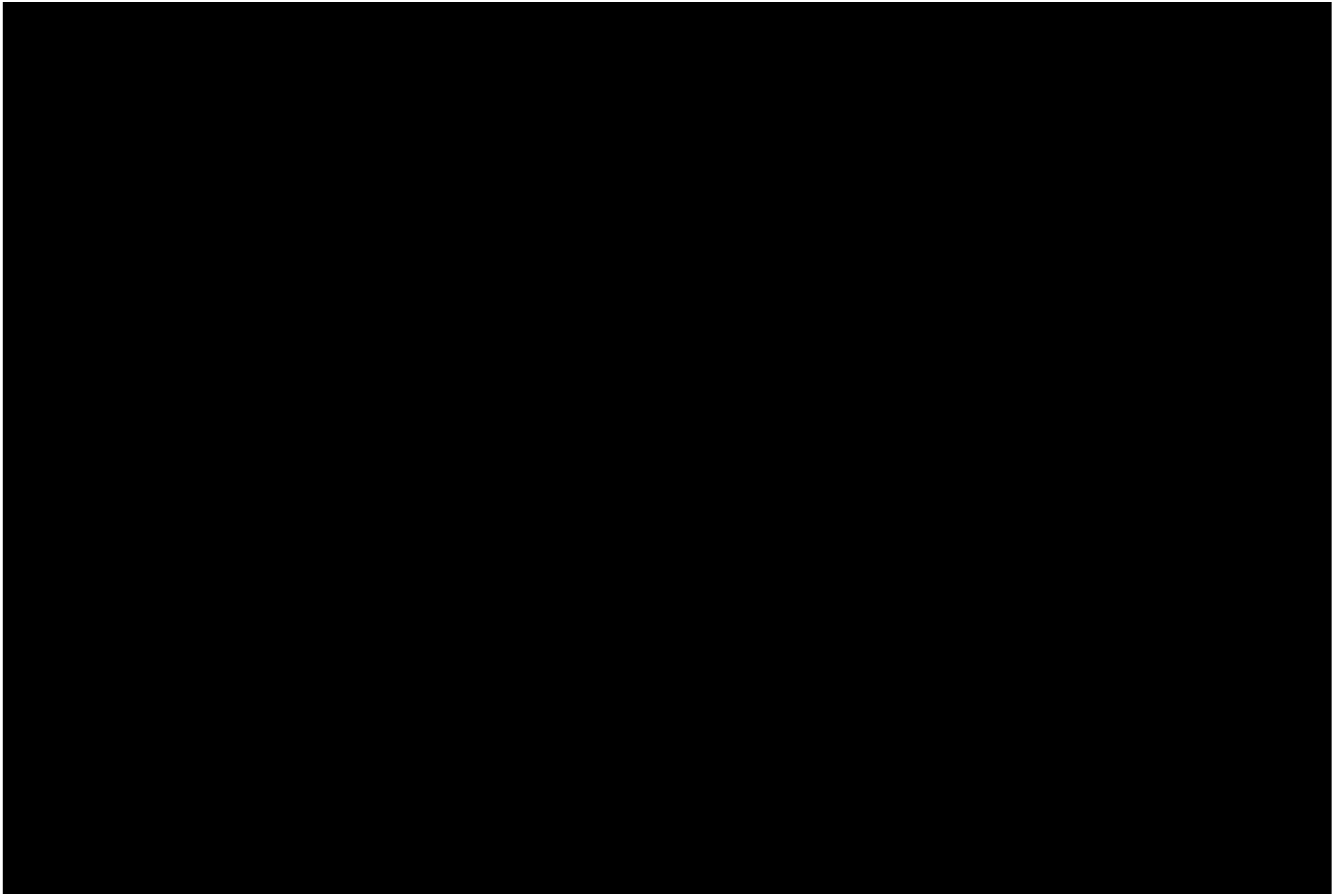
	Roads	Easting	Northing	Estimated depth (m)	Comment
1	Channel Highway - between park area and Flood Road	504420	5235080	Up to 1.8m	Inundation up to 12hrs depending on flood event. Approx 700m length of road.
2	Wilmot Road near Mountain Creek bridge	503411	5237036	Up to 1.0m	Approximately 500m length of road.
3	Glen Huon Road, approx 1km from Huon Bridge	503012	5236139	Up to 0.8m	Approximately 300m length of road.
4	Huon Highway (Short Straight)	502008	5236183	Up to 0.9m	Approximately 280m length of road.
5	Huon Highway Huonville	503870	5235590	Up to 0.1m	Short length of road inundated.

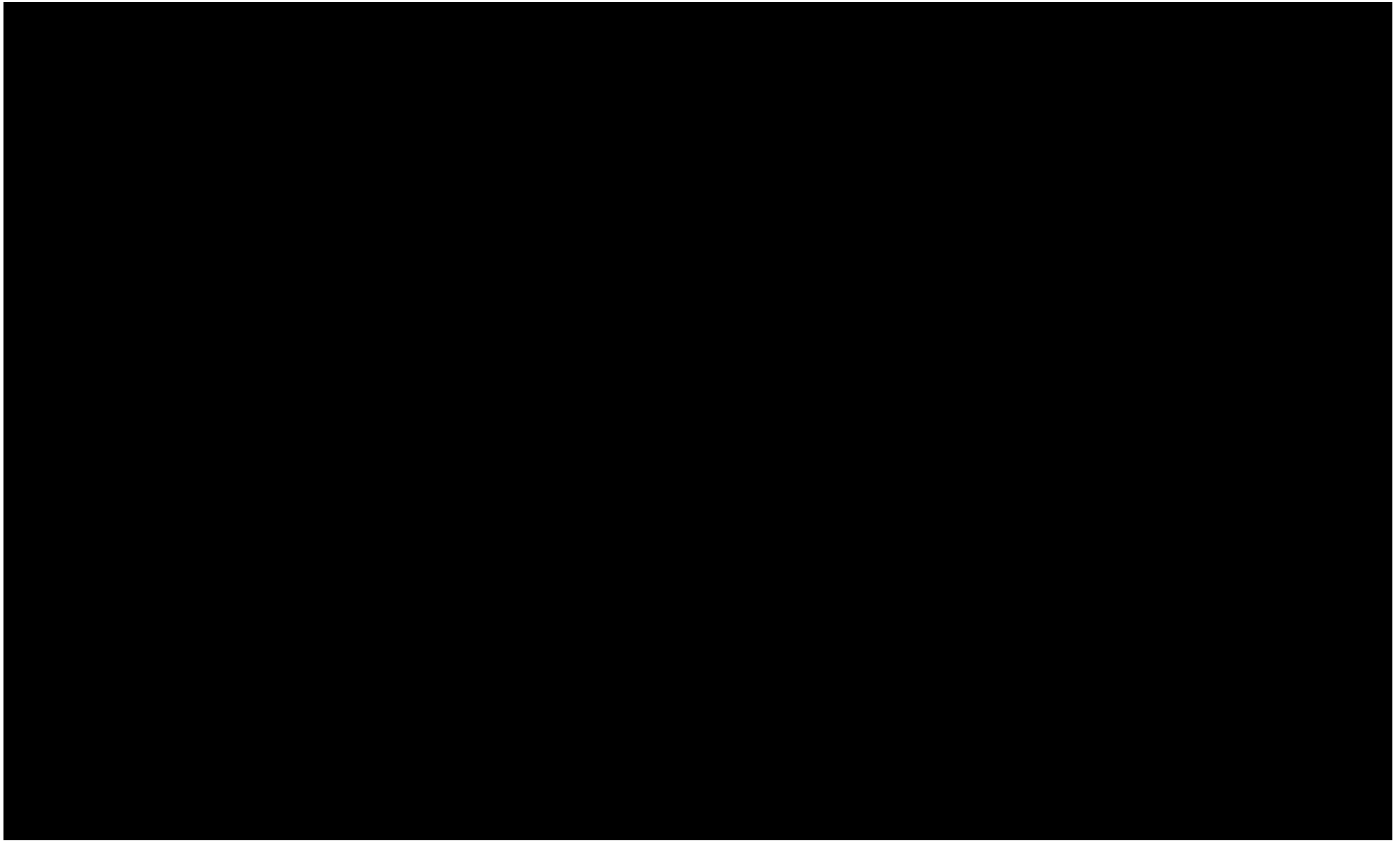
	Bridges	Easting	Northing	Estimated depth (m)	Comment
1	Tahune Bridge	477907	5228581	1.3	**Bridge overtopped.** Water approximately 1.3m above bridge deck level.
2	Weld Rd Bridge	485244	5232805	-1.8	Water approximately 1.8m below bridge deck level.
3	Judbury Bridge	494165	5239266	-3.7	Water approximately 3.7m below bridge deck level.
4	Huonville Bridge	503785	5235423	-1.6	Water approximately 1.6m below bridge deck level.

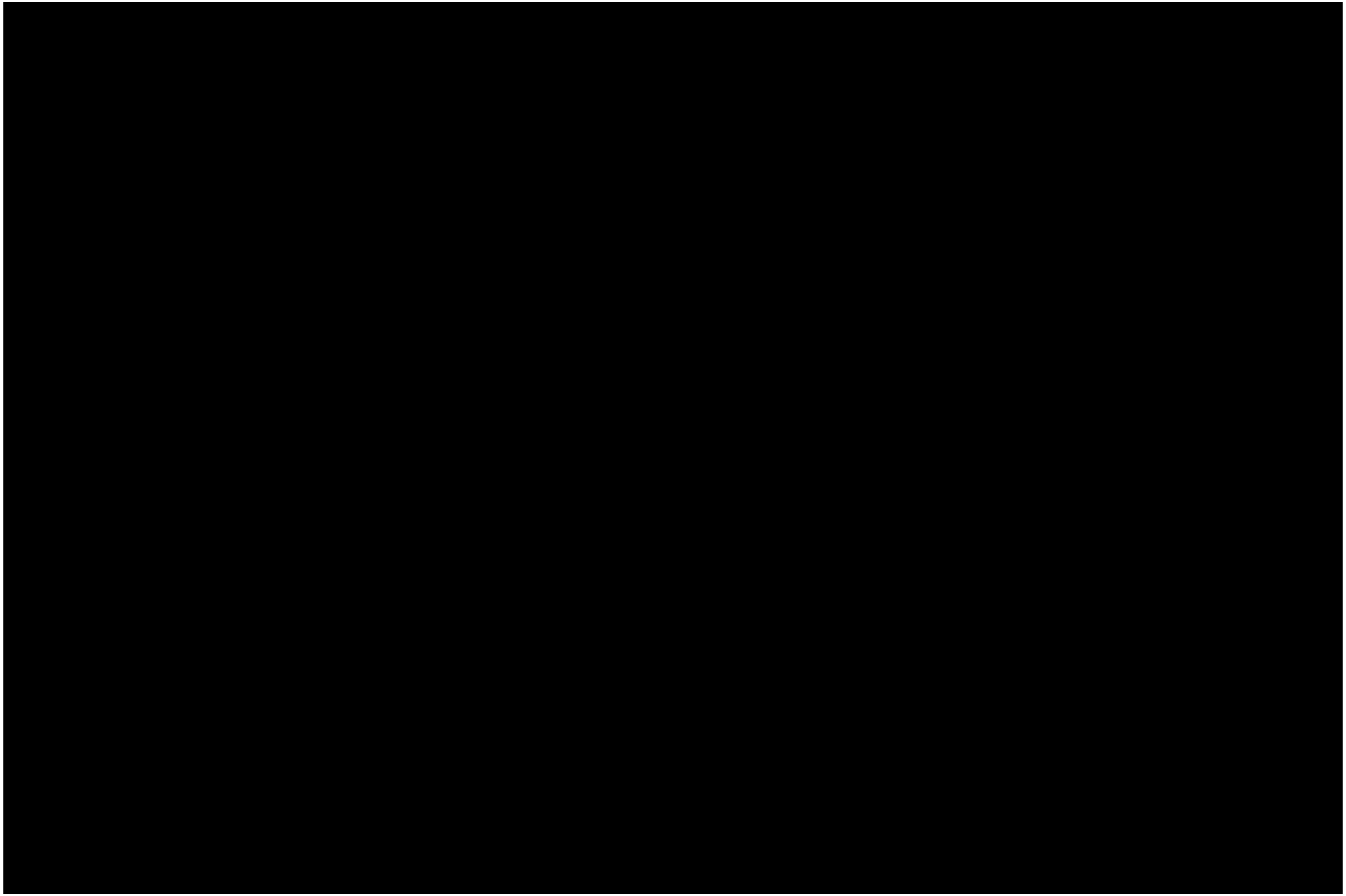
1. Tahune bridge deck level: 50.9 m AHD approx
2. Weld Road bridge deck level: 39.7 m AHD from SPM10617
3. Judbury bridge deck level: 21.71 m AHD from SPM9697 (southern side of bridge). SPM = State Permanent Mark (survey mark).
4. Huonville Bridge deck level: 4.12 m AHD, HTC Survet Station 680 (northern side of bridge at intersection with Channel Highway).

Summary of number of properties threatened

Zone	Area Name	No.
A	Judbury area including Tahune (north of Huon River)	0
B	Judbury-Glen Huon area (south of Huon River)	1
C	Ranelagh	0
D	Wilmot Street, Huonville (past school oval)	2
E	Main Street, Huonville (north of Shield Street)	0
F	Central Huonville	33
G	Flood Road area (eastern Huonville)	1
H	Franklin area, Huon Highway	10
I	Channel Highway	0
J	South of Castle Forbes Bay, Huon Highway	0
K	Cygnet Coast Road (southern section)	0
	Total	47







FLOOD REPORT - NO.3

8.0m at the Judbury Flood Gauge and Mean Sea Level
Equivalent to BoM MAJOR flood
Peak discharge at Judbury: 2720m^3/s
HUON RIVER from JUDBURY to WATERLOO (Huon Estuary), including TAHUNE

Maximum Flood Levels at Bridges

	(m gauge)	(m AHD)
Tahune Bridge	8.4	53.2
Weld Rd Bridge		39.2
Judbury Bridge	7.9	18.8
Huonville Bridge	4.3	2.9

Notes
~ The flood levels have been estimated using XP SWMM software and are relative to the Australian Height Datum (m AHD).
~ Upstream of Judbury the XS WMM model is one-deimensional based on 1:25,000 topographic map contours.
~ Downstream of Judbury the XP SWMM model is a combined 1D/2D model with the floodplain based on LiDAR from Geoscience Australia and the river channel based on a variety of survey sources.
~ The flood event resulting in a level of 6.0m at the Judbury gauge is equivalent to a 1:4 AEP flood event.
~ Coordinates are MGA (Map Grid of Australia), Zone 55.
~ For zones, refer to Appendix C of the FEP.

~ Emergency services should check maps (e.g. Street Atlas) for nearby properties that may be affected.
~ Buildings floor levels greater than 1.0m above the predicted flood level are not included in this table.

Summary of flooded infrastructure

Bridges

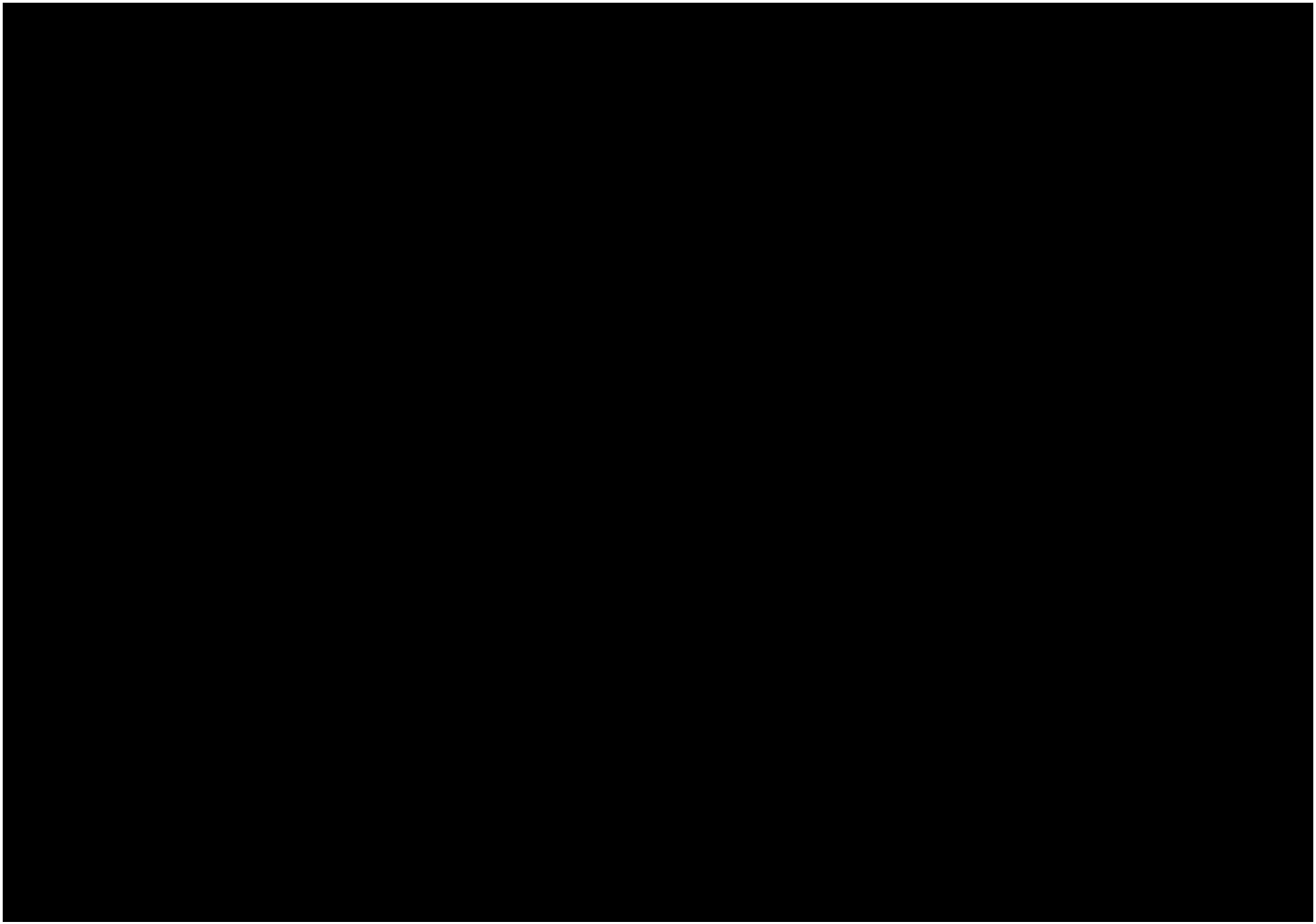
	Roads	Easting	Northing	Estimated depth (m)	Comment
1	Channel Highway - between park area and Flood Road	504420	5235080	Up to 2.0m	Inundation up to 12hrs depending on flood event. Approx 1000m length of road.
2	Wilmot Road near Mountain Creek bridge	503411	5237036	Up to 1.1m	Approximately 500m length of road.
3	Glen Huon Road, approx 1km from Huon Bridge	503012	5236139	Up to 1.0m	Approximately 920m length of road.
4	Huon Highway (Short Straight)	502008	5236183	Up to 1.1m	Approximately 300m length of road.
5	Huon Highway Huonville	503870	5235590	Up to 0.5m	Approximately 140m of road between roadabout and Huon River.

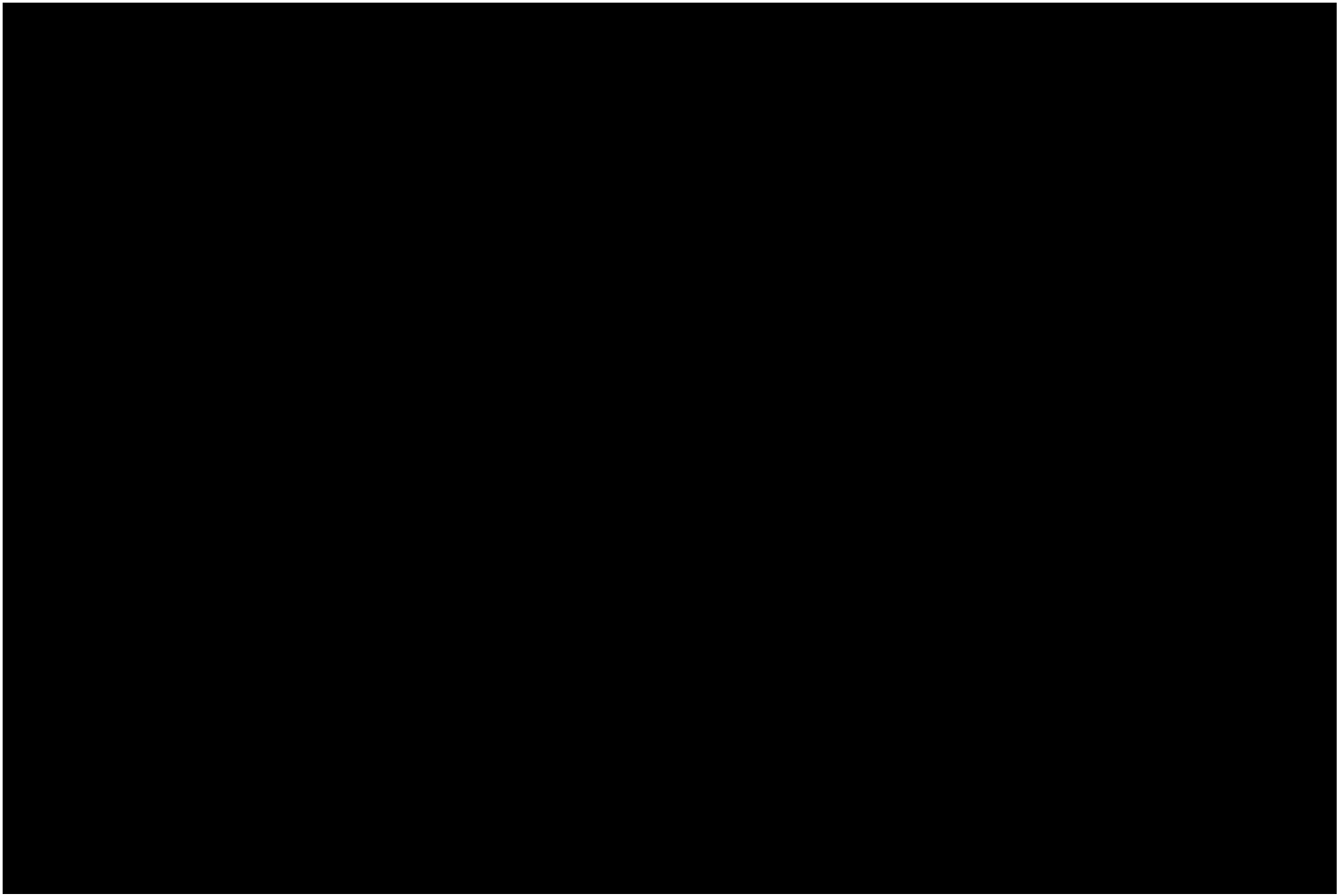
	Bridges	Easting	Northing	Estimated depth (m)	Comment
1	Tahune Bridge	477907	5228581	2.3	**Bridge overtopped.** Water approximately 2.3m above bridge deck level.
2	Weld Rd Bridge	485244	5232805	-0.5	Water approximately 0.5m below bridge deck level.
3	Judbury Bridge	494165	5239266	-2.9	Water approximately 2.9m below bridge deck level.
4	Huonville Bridge	503785	5235423	-1.2	Water approximately 1.2m below bridge deck level.

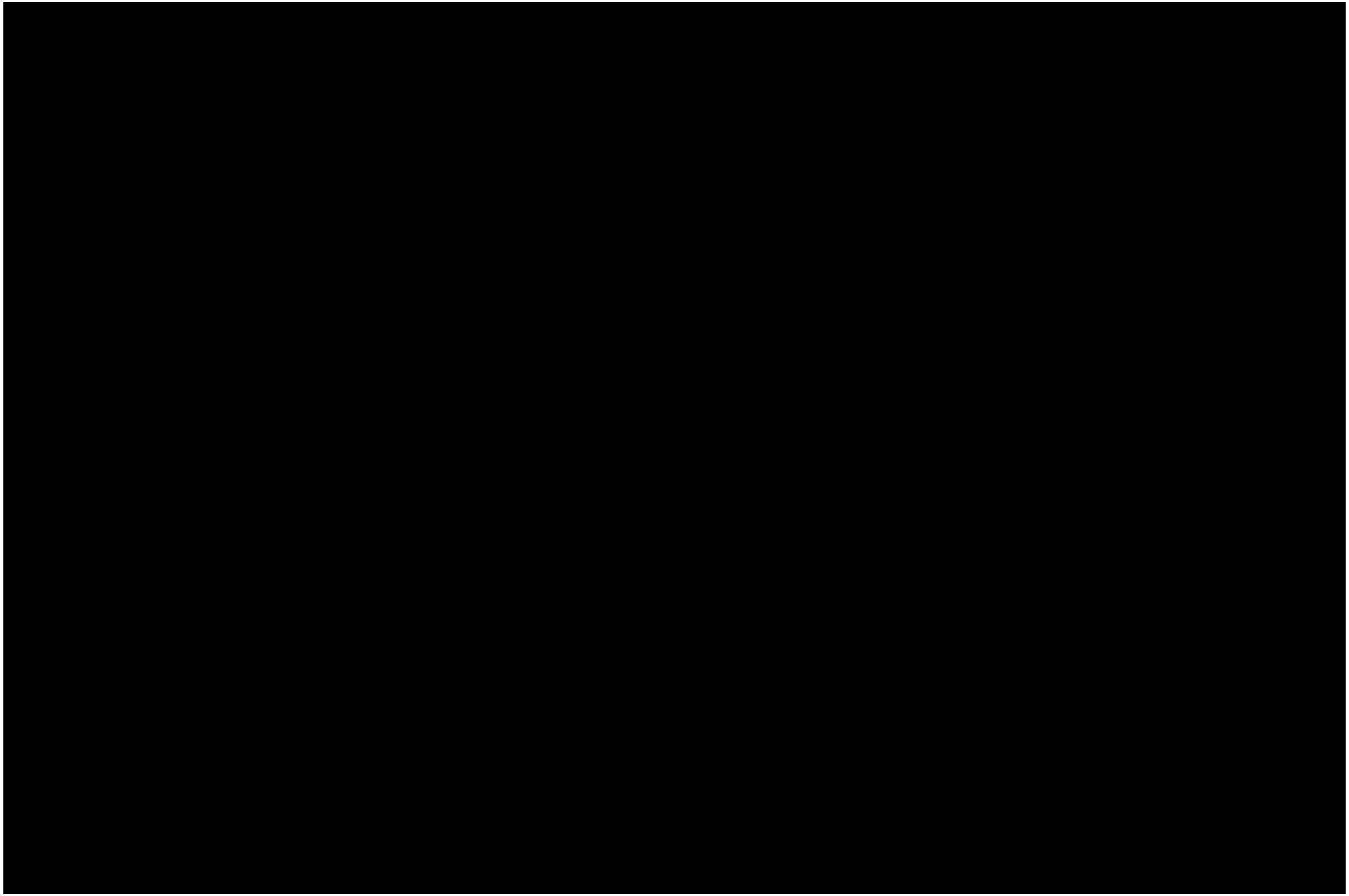
1. Tahune bridge deck level: 50.9 m AHD approx
2. Weld Road bridge deck level: 39.7 m AHD from SPM10617
3. Judbury bridge deck level: 21.71 m AHD from SPM9697 (southern side of bridge). SPM = State Permanent Mark (survey mark).
4. Huonville Bridge deck level: 4.12 m AHD, HTC Survet Station

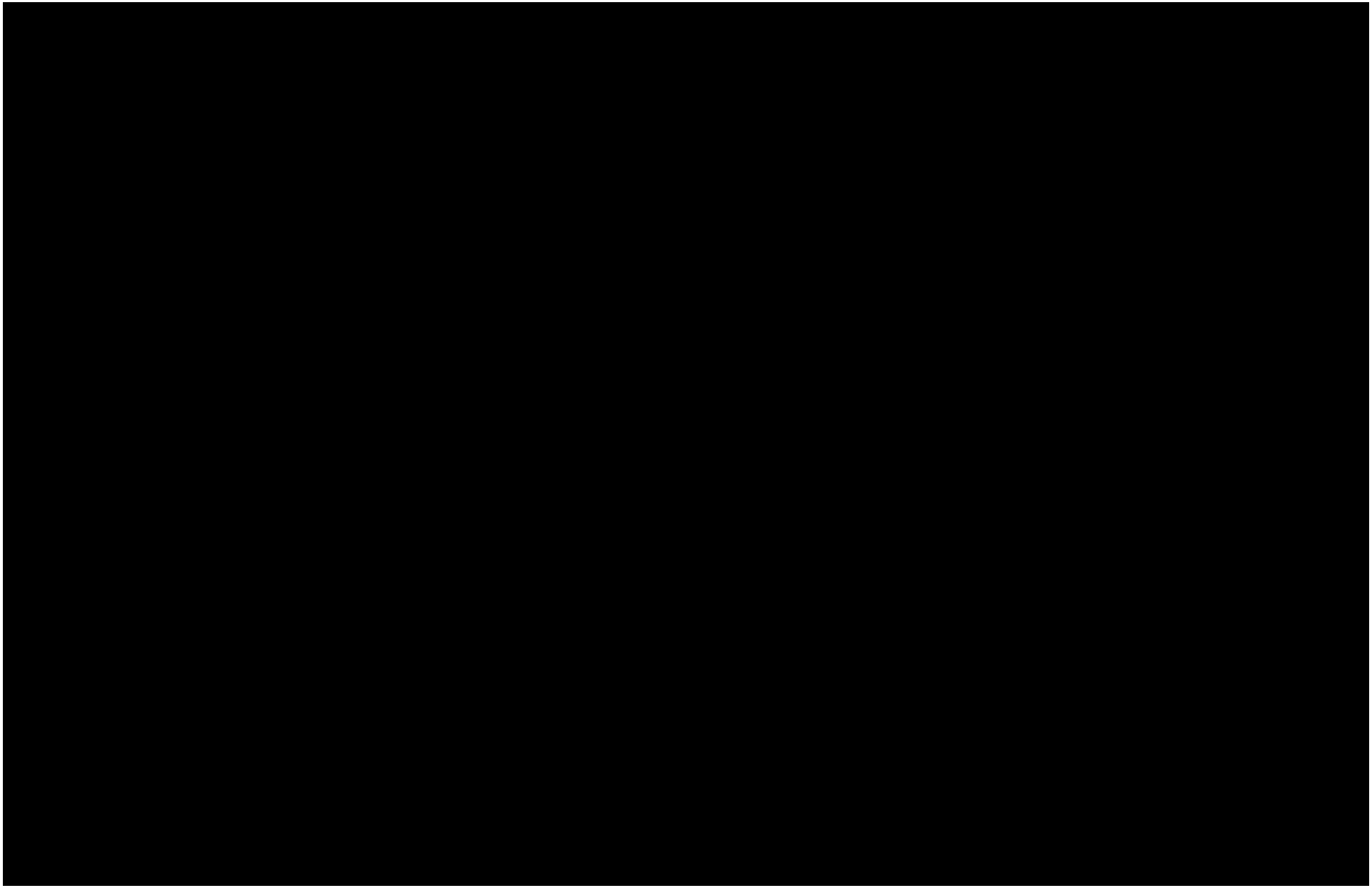
Summary of number of properties threatened

Zone	Area Name	No.
A	Judbury area including Tahune (north of Huon River)	0
B	Judbury-Glen Huon area (south of Huon River)	5
C	Ranelagh	1
D	Wilmot Street, Huonville (past school oval)	3
E	Main Street, Huonville (north of Shield Street)	2
F	Central Huonville	54
G	Flood Road area (eastern Huonville)	1
H	Franklin area, Huon Highway	15
I	Channel Highway	0
J	South of Castle Forbes Bay, Huon Highway	0
K	Cygnet Coast Road (southern section)	0
	Total	81









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FLOOD REPORT - NO.4

Scotts Peak Dam - Dam Crest Flood Dambreak
22.7m at the Judbury Flood Gauge and Mean Sea Level

HUON RIVER from JUDBURY to WATERLOO (Huon Estuary), including TAHUNE

Maximum Flood Levels at Bridges

	(m gauge)	(m AHD)
Tahune Bridge	Not estimated	
Weld Rd Bridge	Not estimated	
Judbury Bridge	22.7	33.6
Huonville Bridge	19.4	18.0

Notes

~ The flood levels have been estimated using MIKE Flood software and are relative to the Australian Height Datum (m AHD).
~ The flood levels are as per the 2007 FEP. This table has been updated based on new building data but not new modelling.
~ Upstream of Judbury the MIKE Flood model is one-deimensional based on 1:25,000 topographic map contours.
~ Downstream of Judbury the MIKE Flood model is 2D with the floodplain based on LiDAR from Geoscience Australia and the river channel based on a variety of survey sources.

~ Coordinates are MGA (Map Grid of Australia), Zone 55.
~ For zones, refer to Appendix C of the FEP.

~ Emergency services should check maps (e.g. Street Atlas) for nearby properties that may be affected.
~ Buildings with floor levels greater than 1.0m above the predicted flood level are not included in this table.

Summary of flooded infrastructure

Bridges

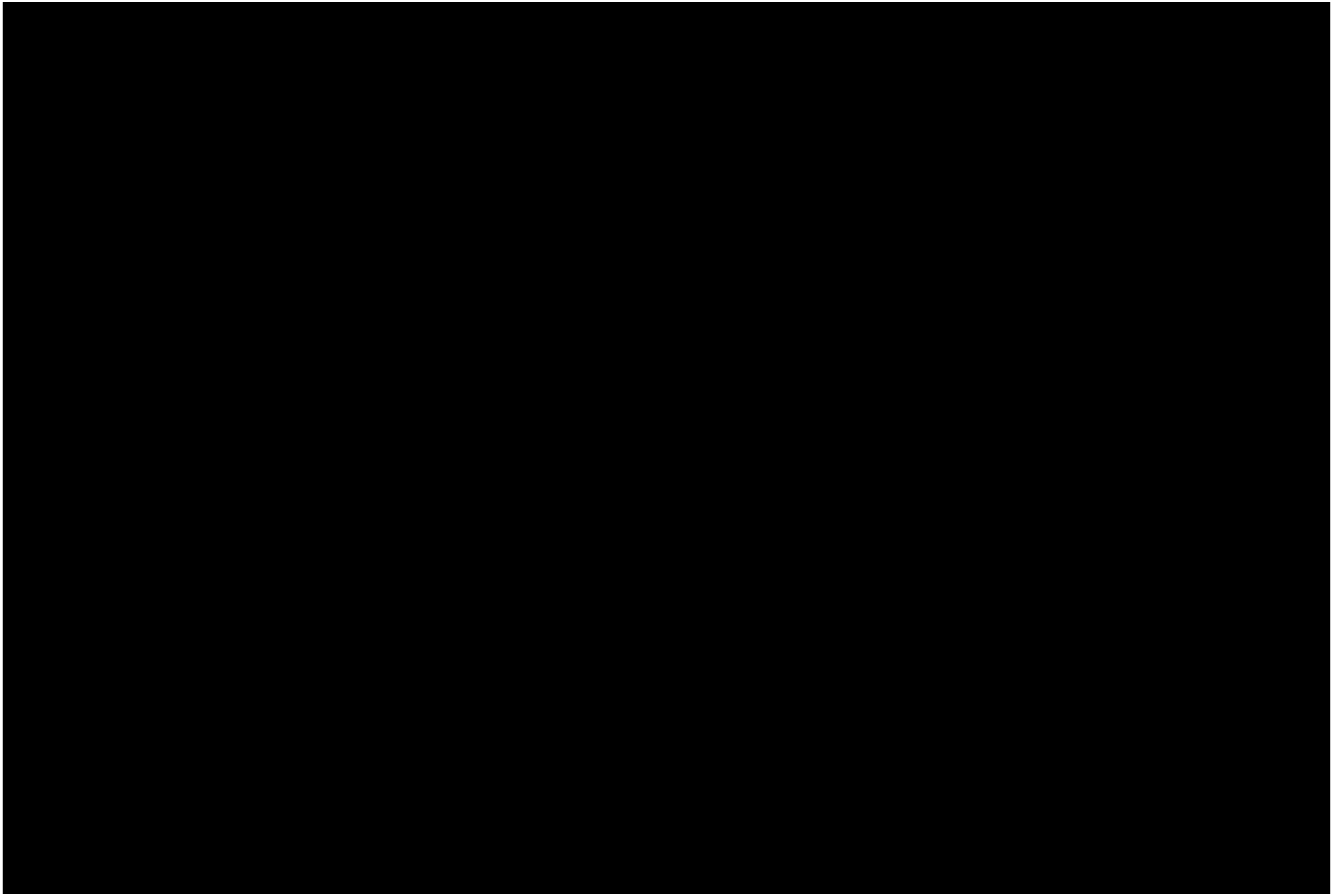
	Roads	Easting	Northing	Estimated depth (m)	Comment
1	Channel Highway	504420	5235080	Greater than 1m	Significant length of Highway inundated between Huonville and Cradoc Hill Road
2	Wilmot Road near Mountain Creek bridge	503411	5237036	Greater than 1m	Inundated for full length.
3	Glen Huon Road, approx 1km from Huon Bridge	503012	5236139	Greater than 1m	Inundated at numerous locations along its length.
4	Huon Highway	502008	5236183	Greater than 1m	Significant length of Highway inundated between Huonville and Port Huon.
5	Huonville	503870	5235590	Greater than 1m	All roads and streets in Huonville town centre inundated.

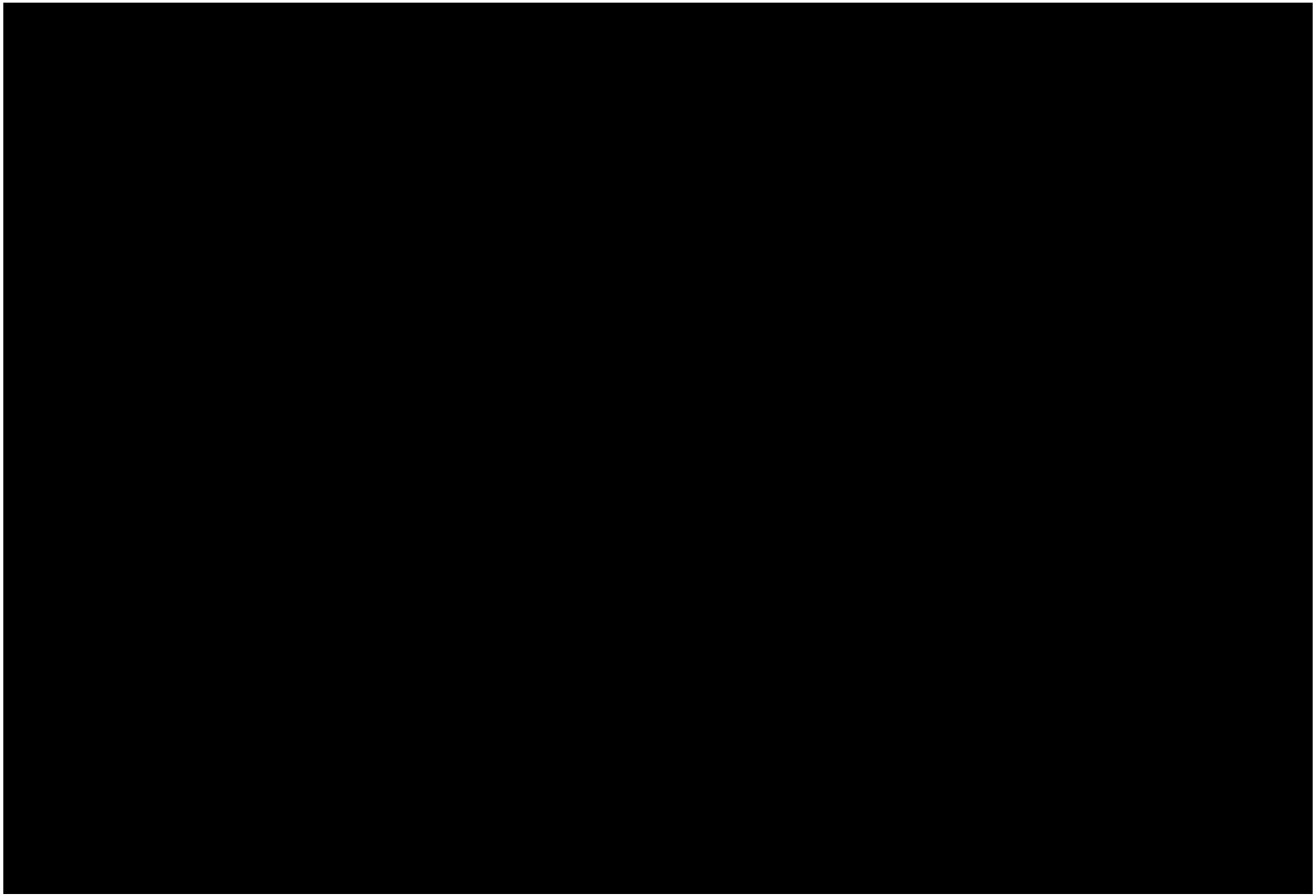
	Bridges	Easting	Northing	Estimated depth (m)	Comment
1	Tahune Bridge	477907	5228581		Bridge overtopped - likely to be washed away.
2	Weld Rd Bridge	485244	5232805		Bridge overtopped - likely to be washed away.
3	Judbury Bridge	494165	5239266	11.9	Bridge overtopped - likely to be washed away.
4	Huonville Bridge	503785	5235423	13.9	Bridge overtopped - likely to be washed away.

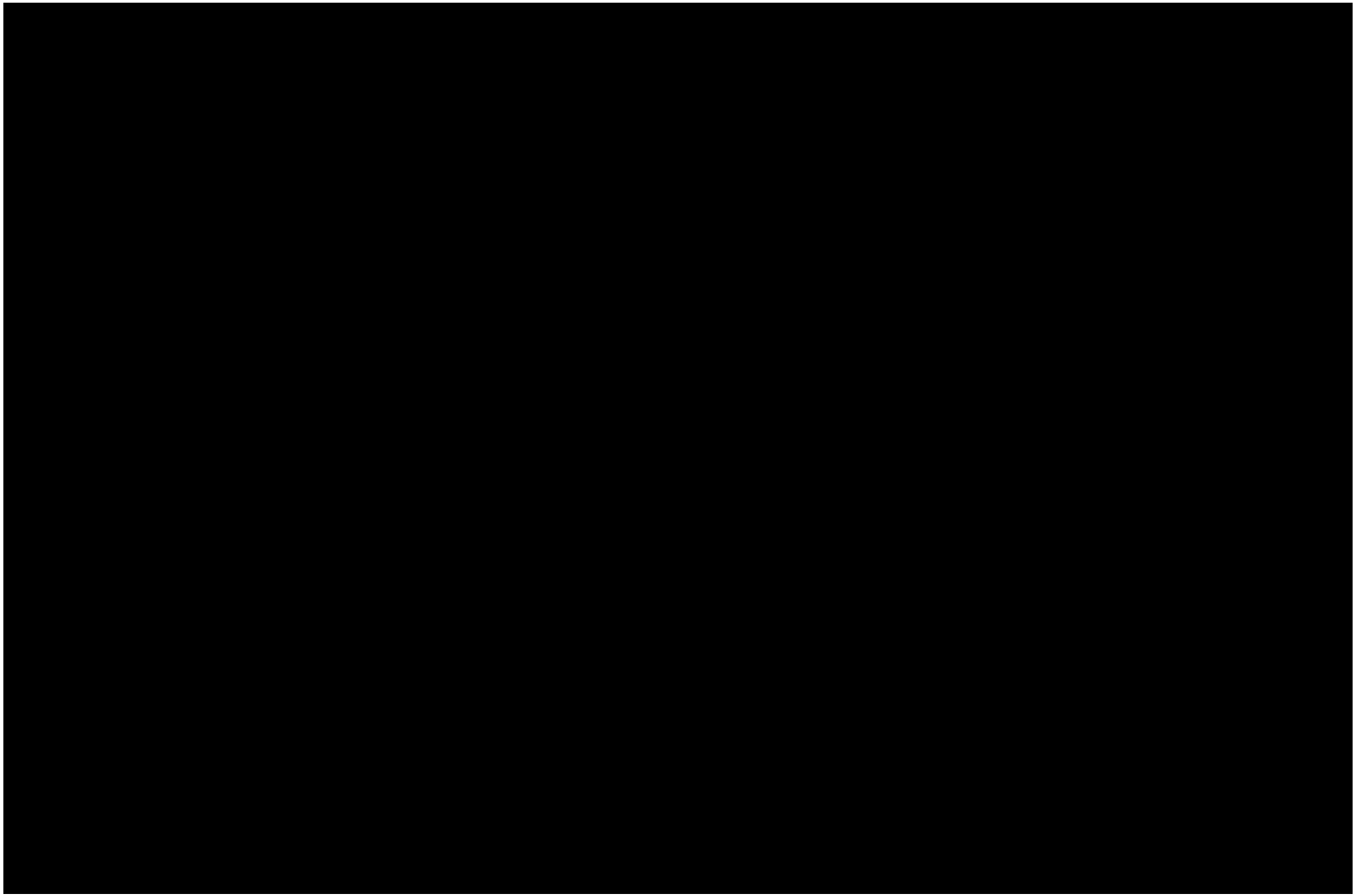
1. Tahune bridge deck level: 50.9 m AHD approx
2. Weld Road bridge deck level: 39.7 m AHD from SPM10617
3. Judbury bridge deck level: 21.71 m AHD from SPM9697 (southern side of bridge). SPM = State Permanent Mark (survey mark).
4. Huonville Bridge deck level: 4.12 m AHD, HTC Survet Station 680 (northern side of bridge at intersection with Channel Highway).

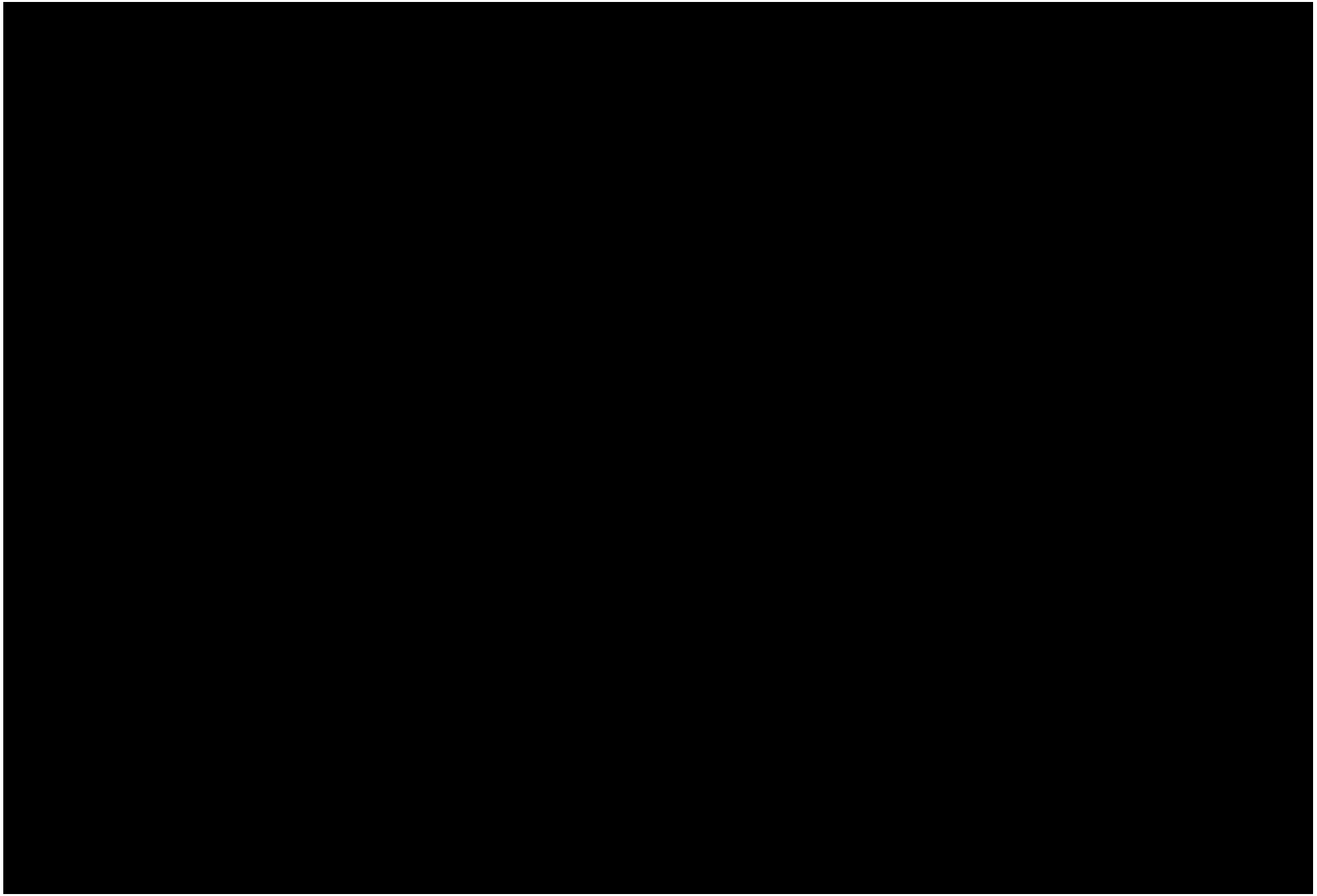
Summary of number of properties threatened

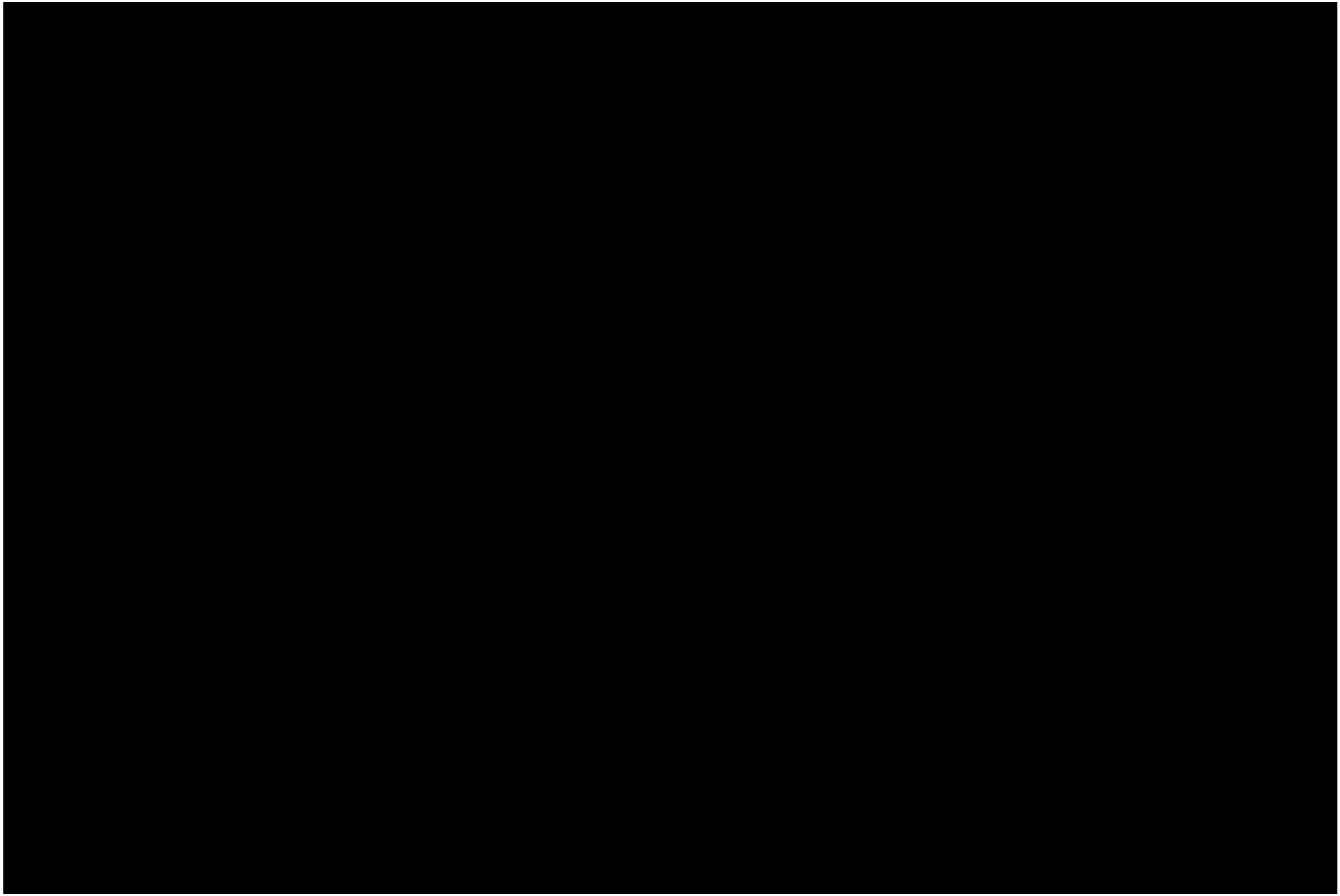
Zone	Area Name	No.
A	Judbury area including Tahune (north of Huon River)	19
B	Judbury-Glen Huon area (south of Huon River)	73
C	Ranelagh	99
D	Wilmot Street, Huonville (past school oval)	68
E	Main Street, Huonville (north of Shield Street)	140
F	Central Huonville	370
G	Flood Road area (eastern Huonville)	96
H	Franklin area, Huon Highway	217
I	Channel Highway	22
J	South of Castle Forbes Bay, Huon Highway	66
K	Cygnet Coast Road (southern section)	13
	Total	1183

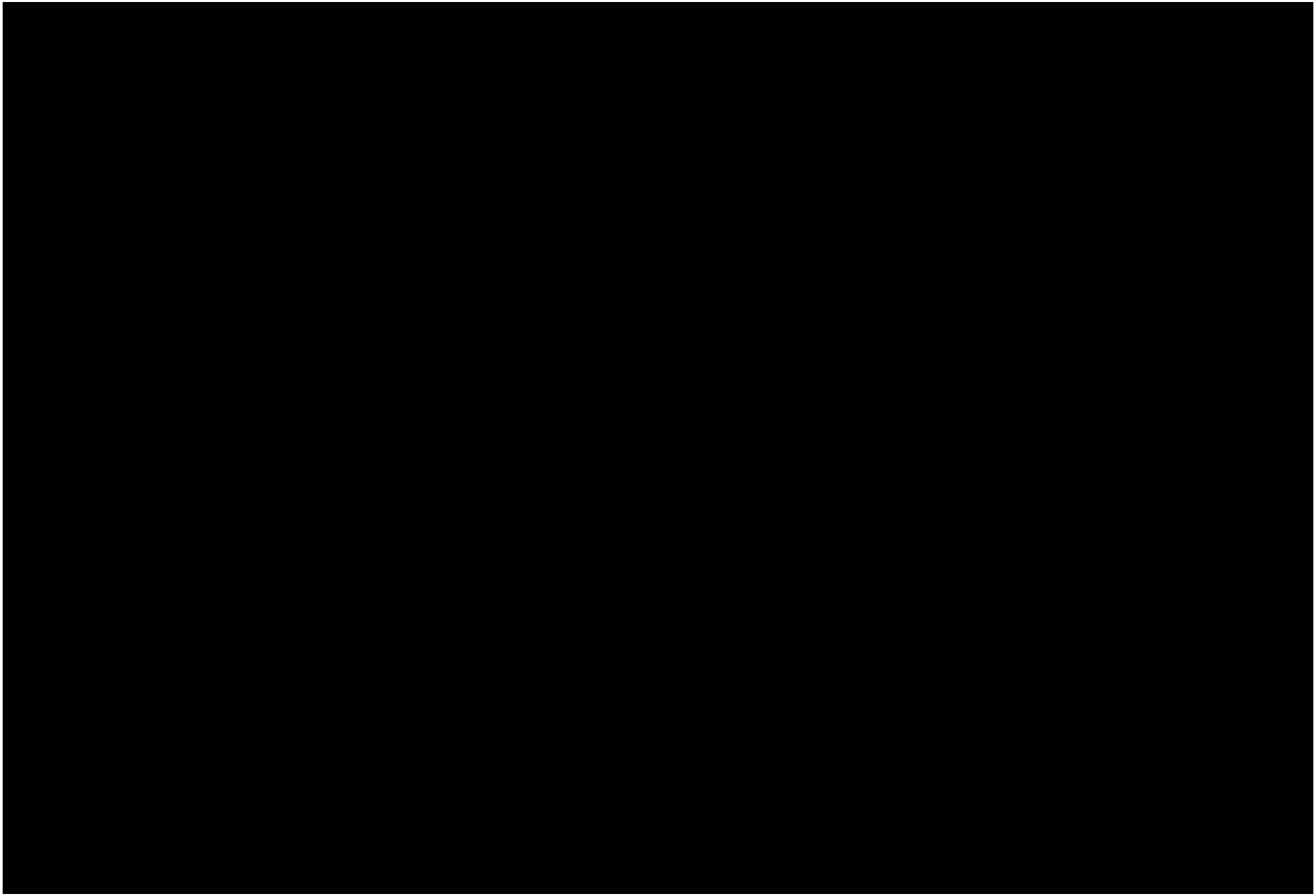


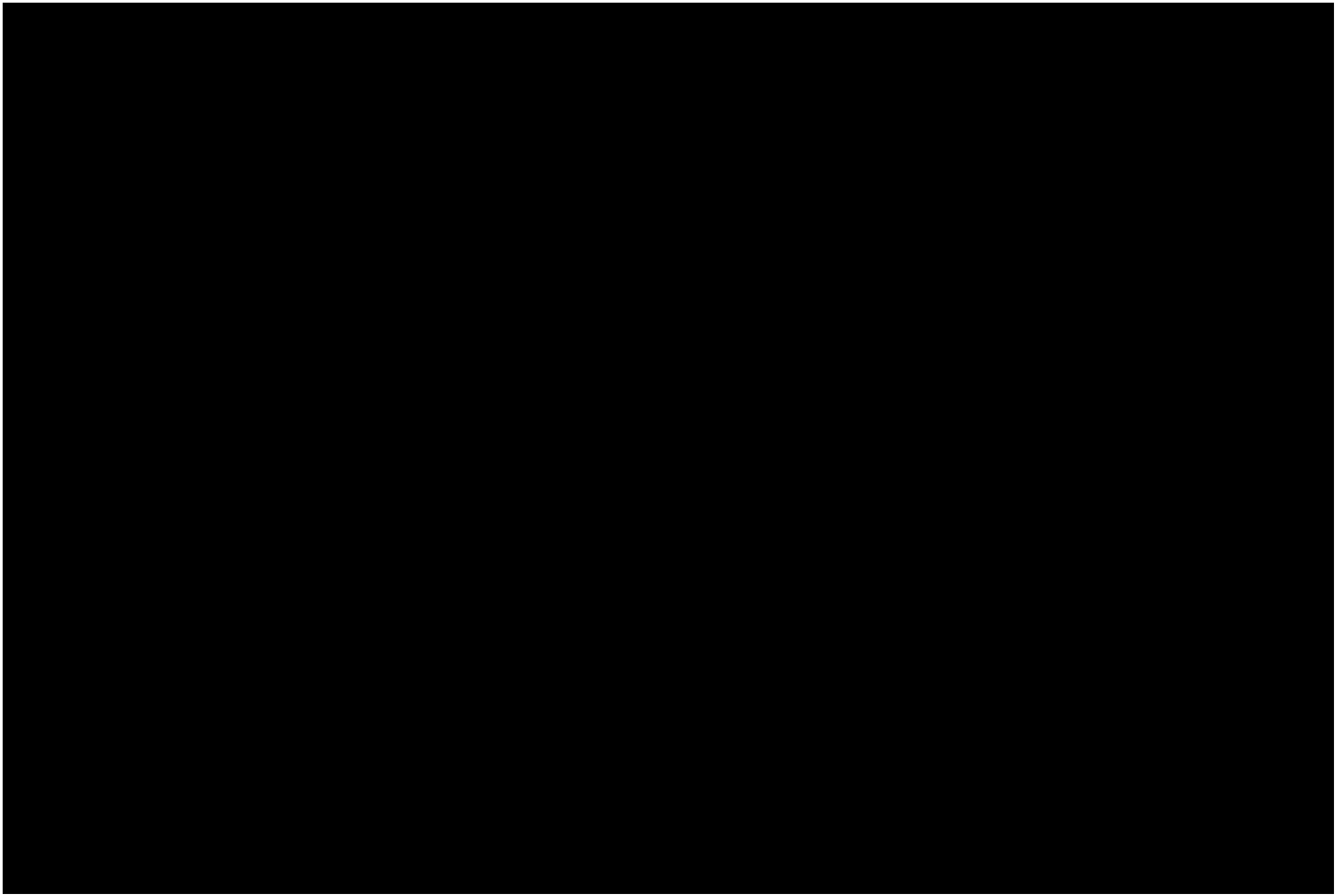


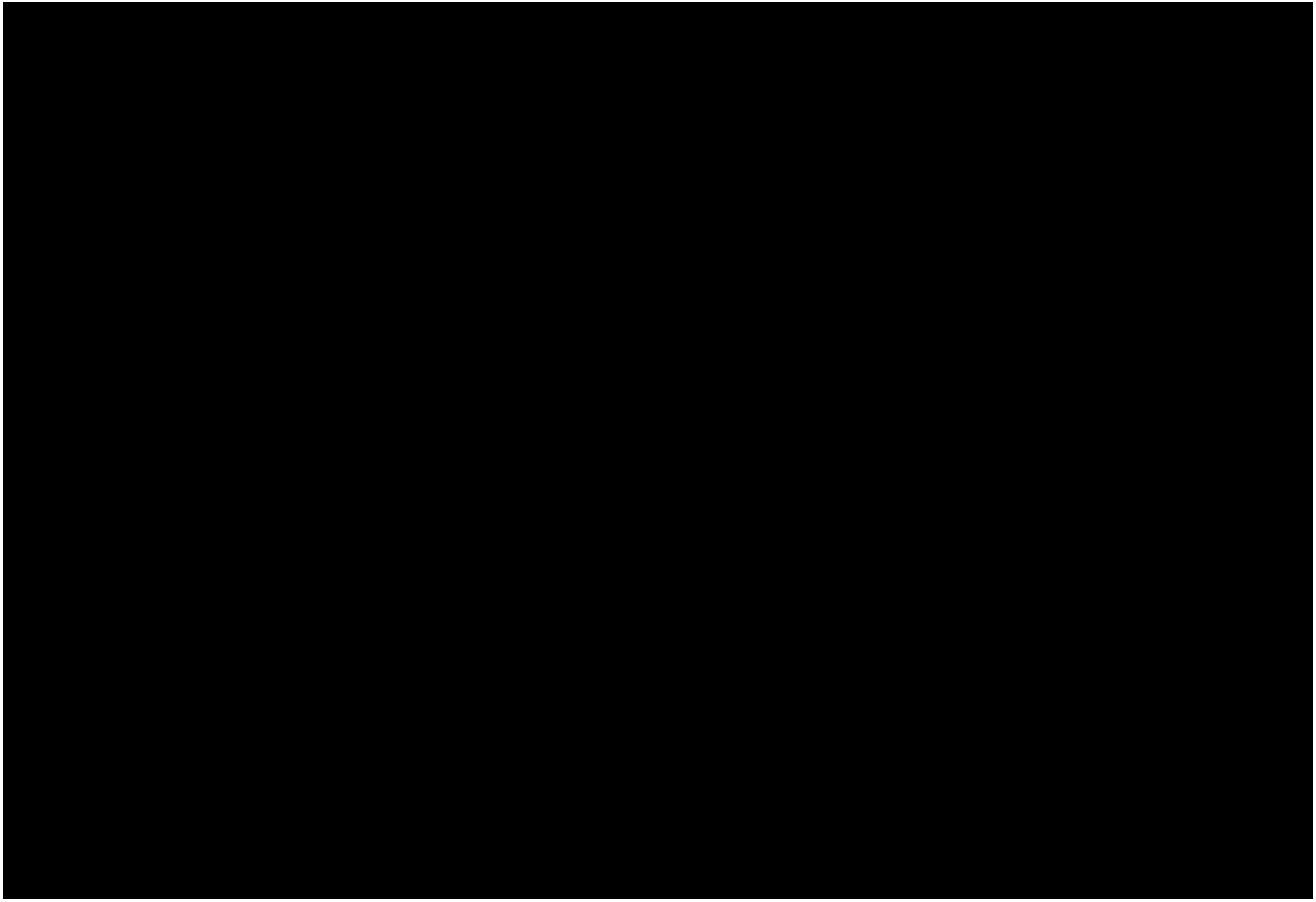


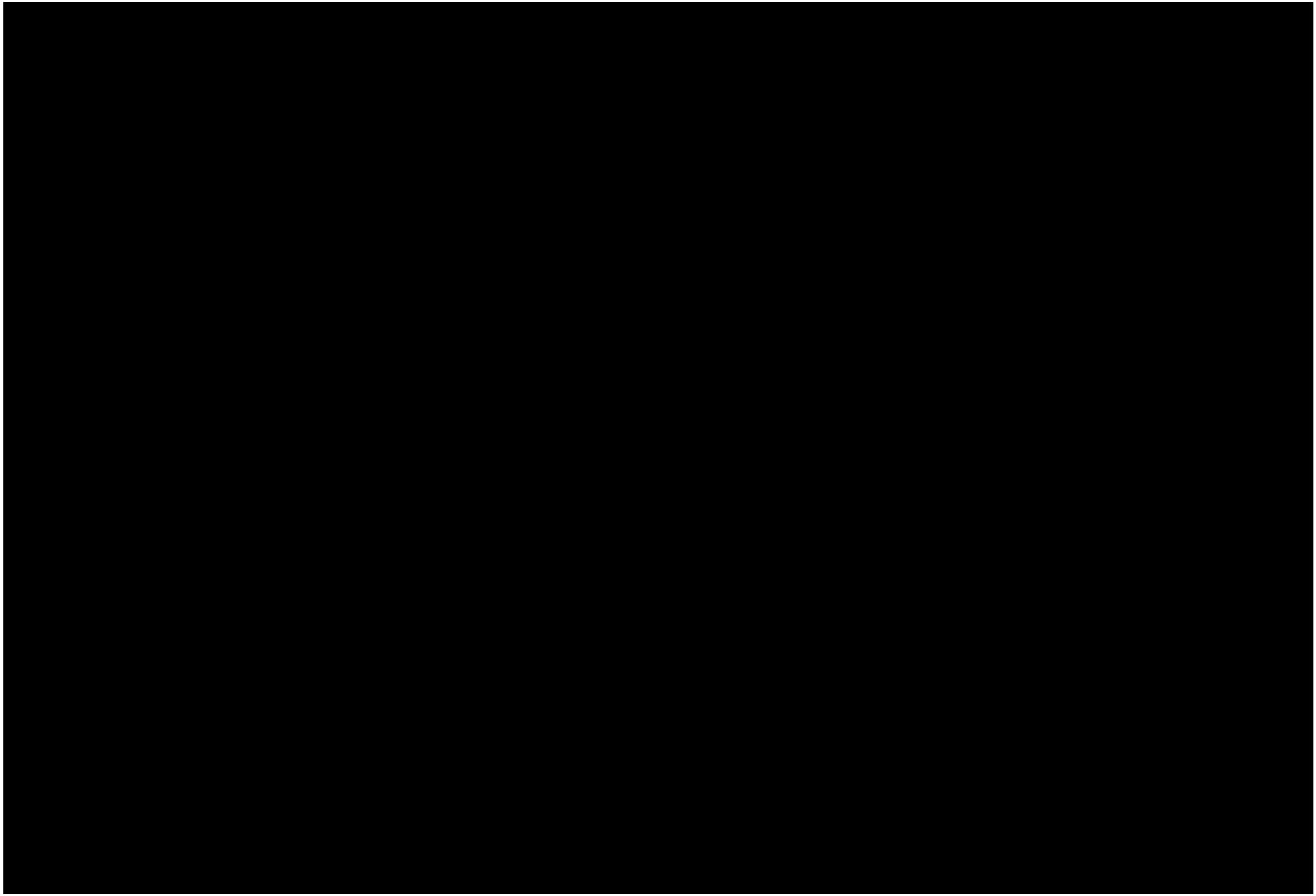


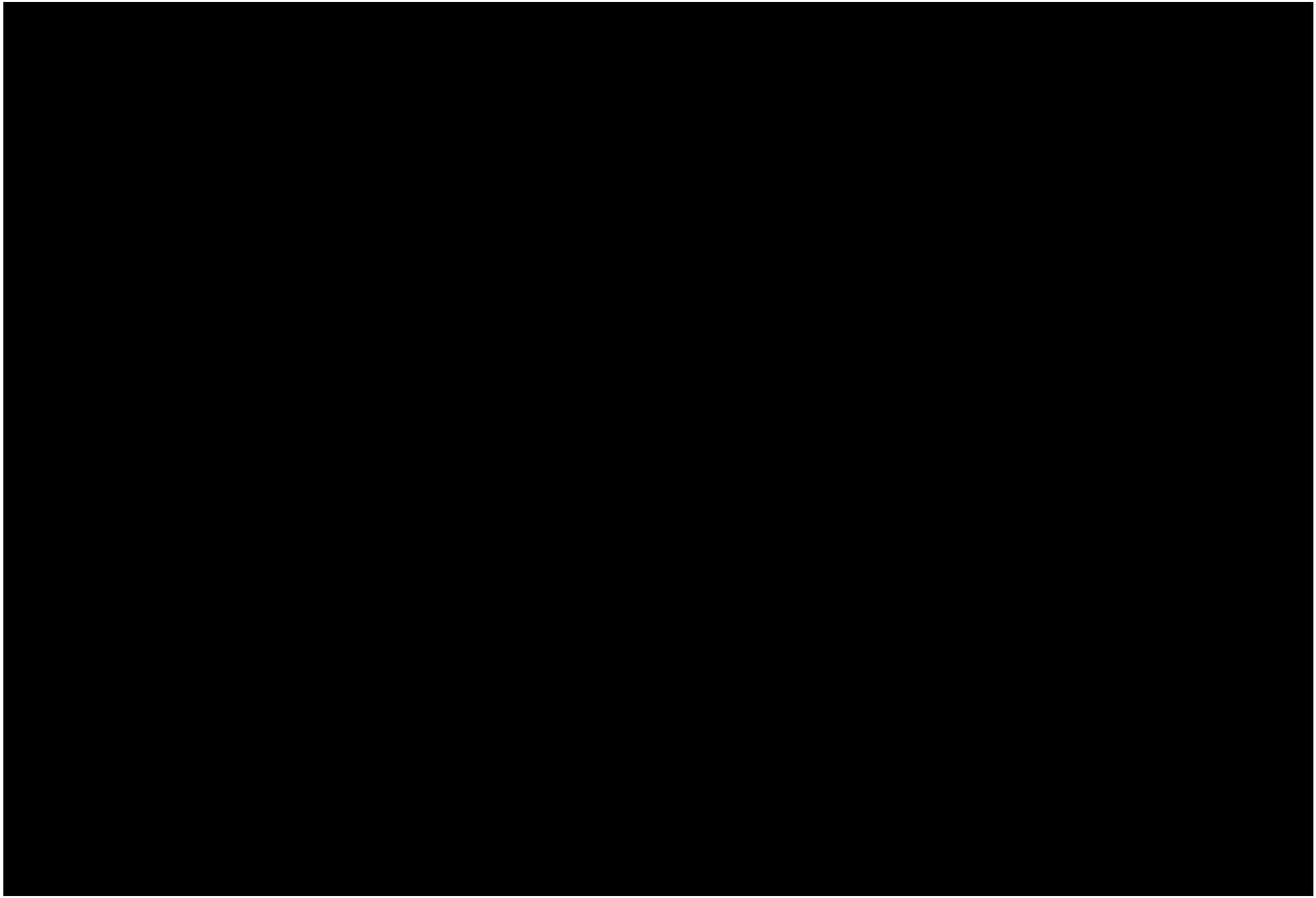


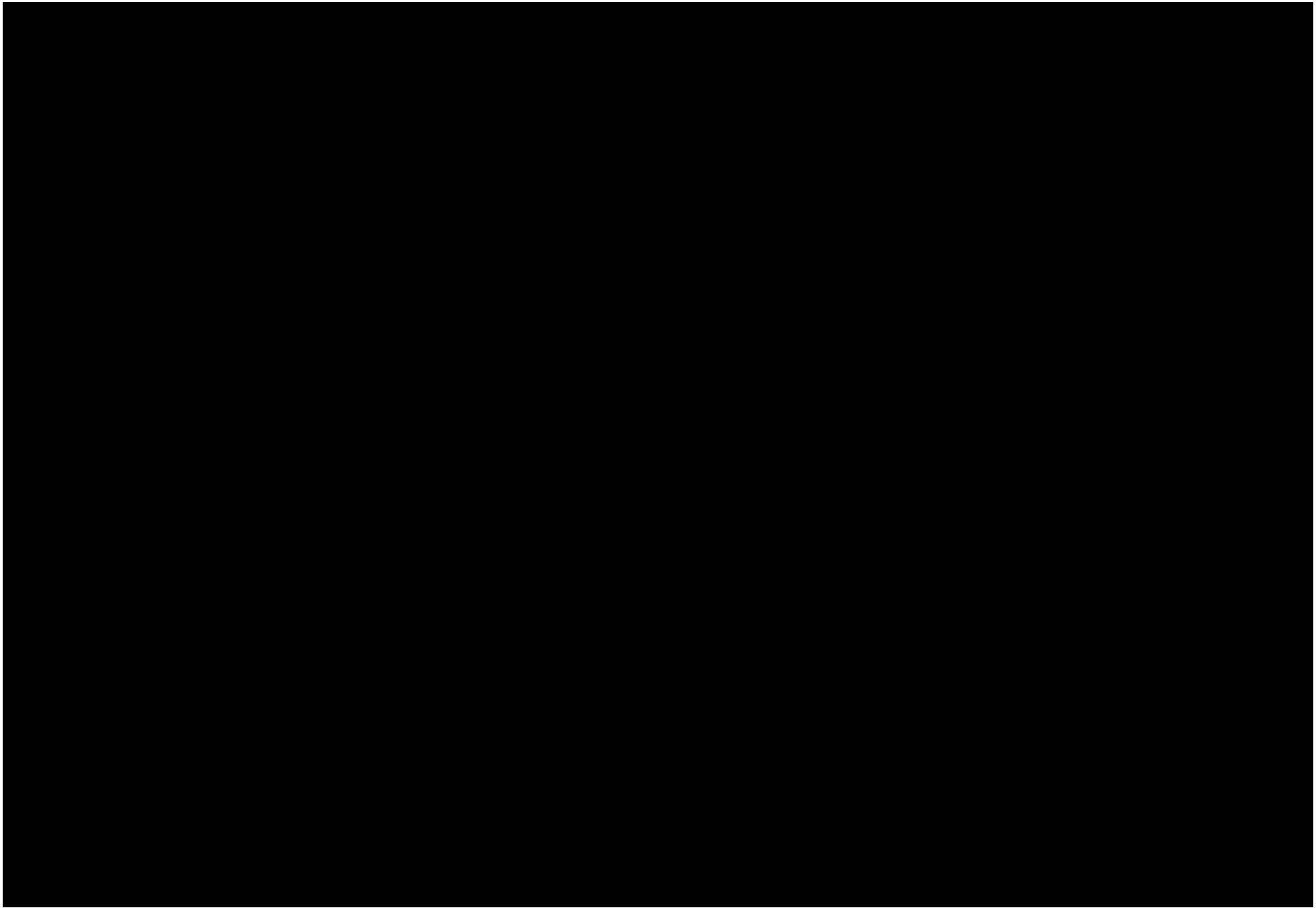


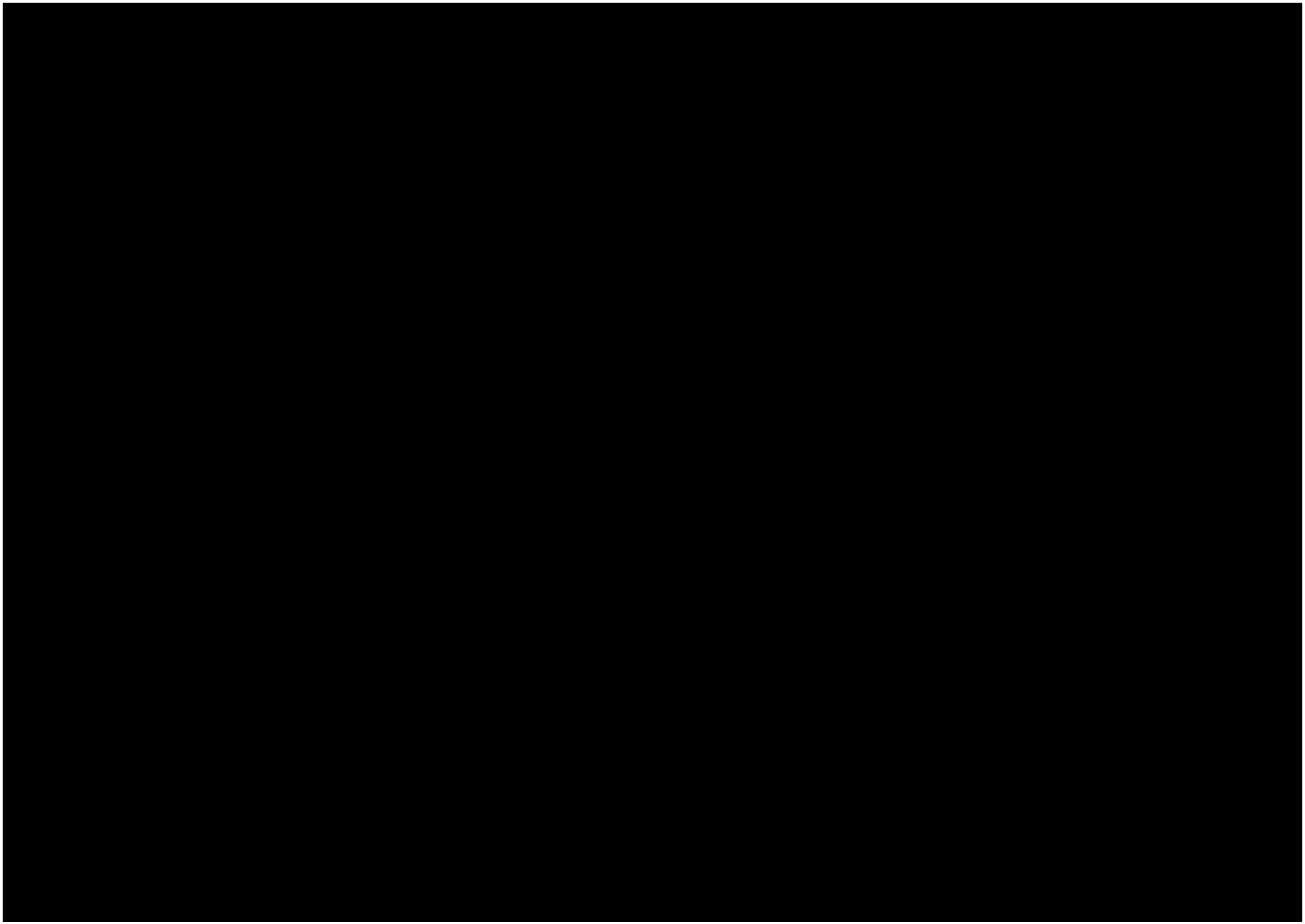


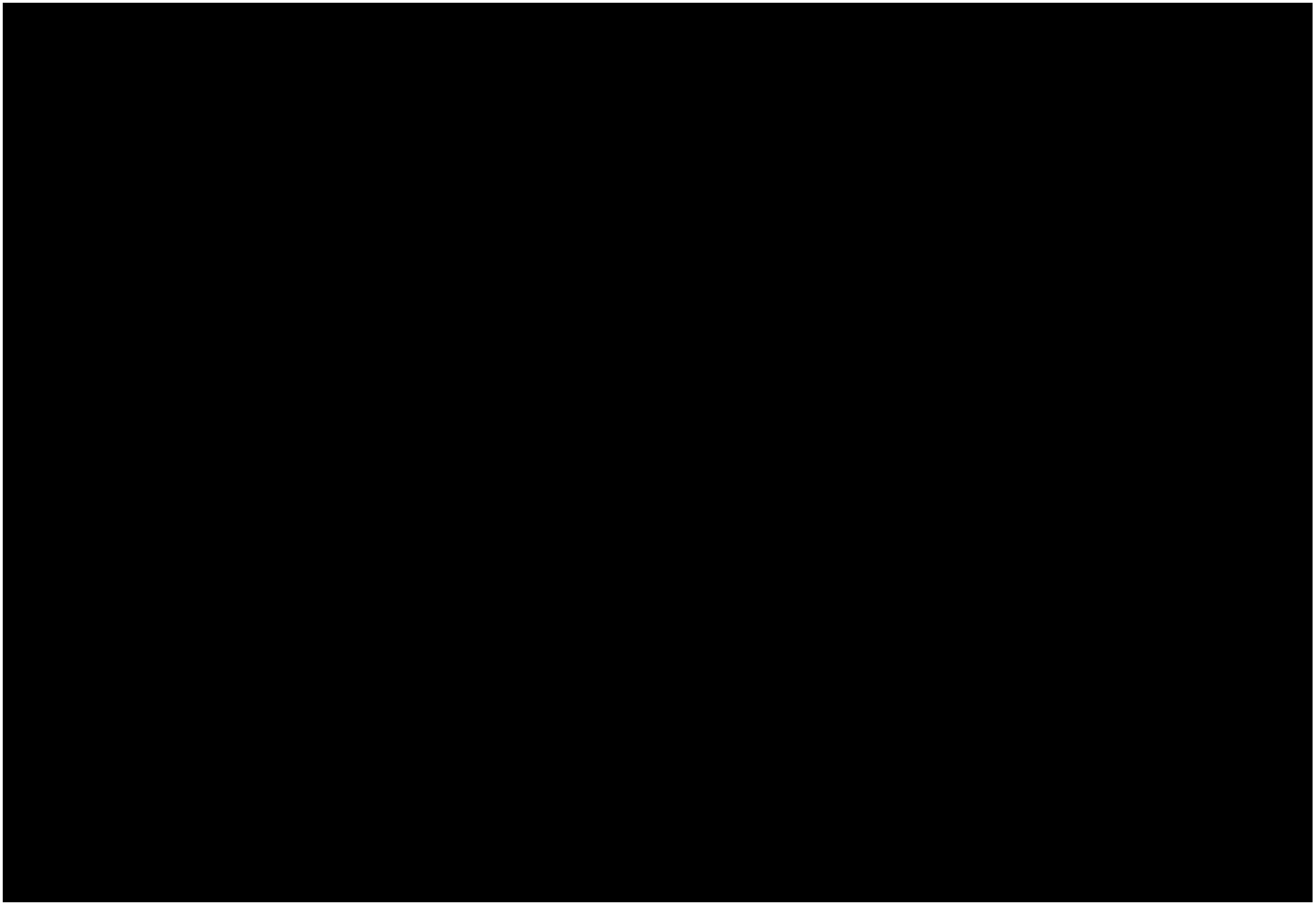


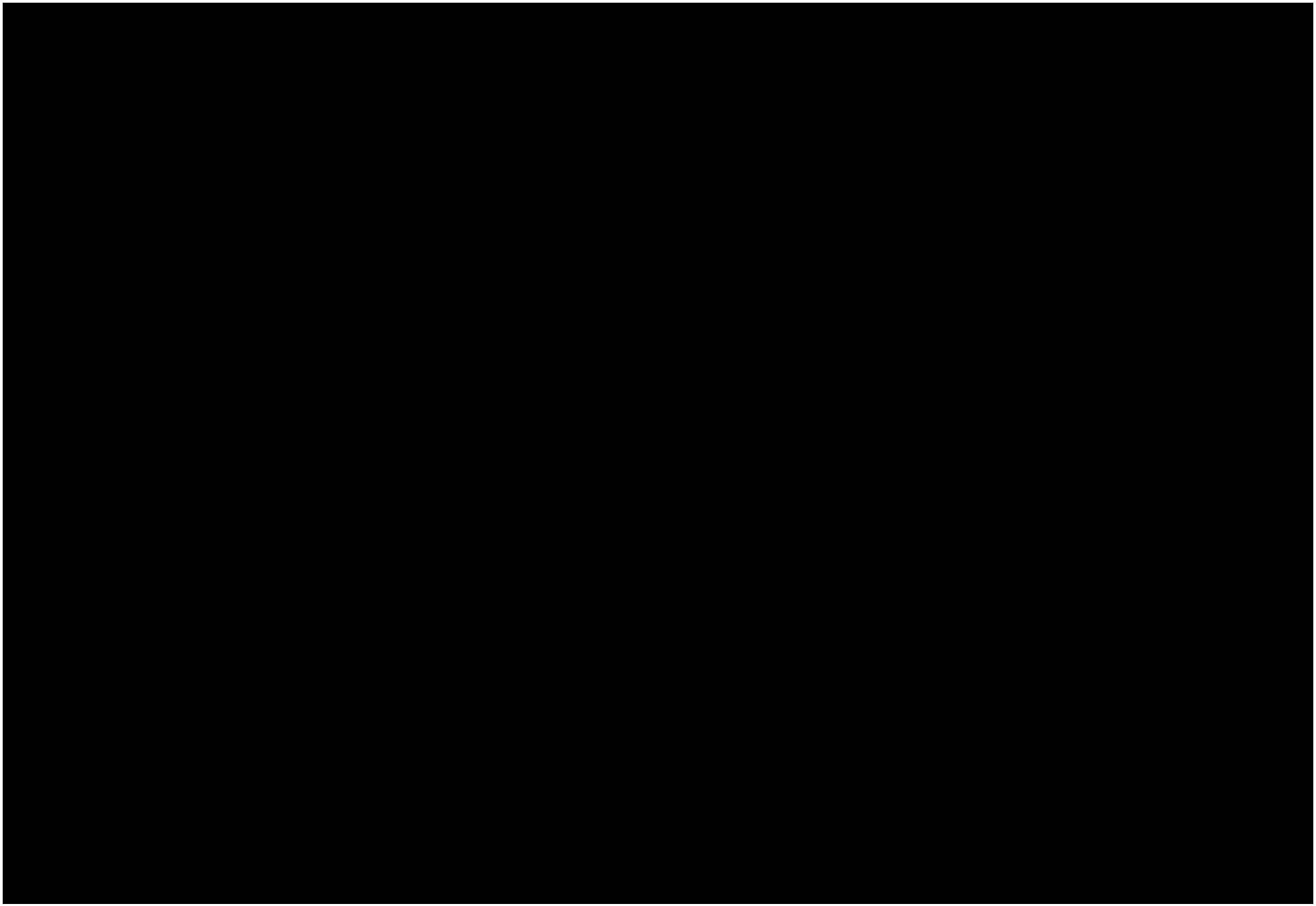


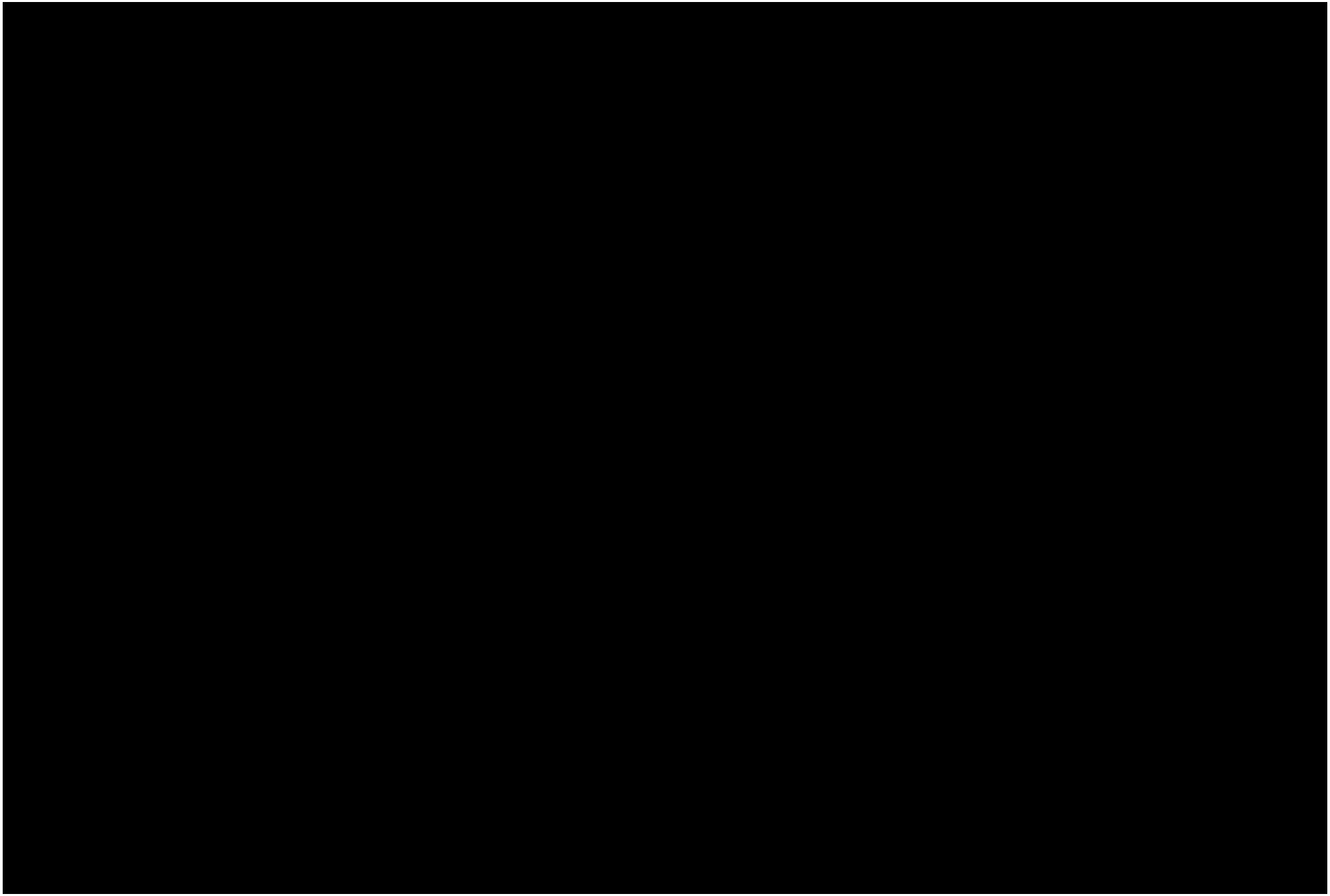


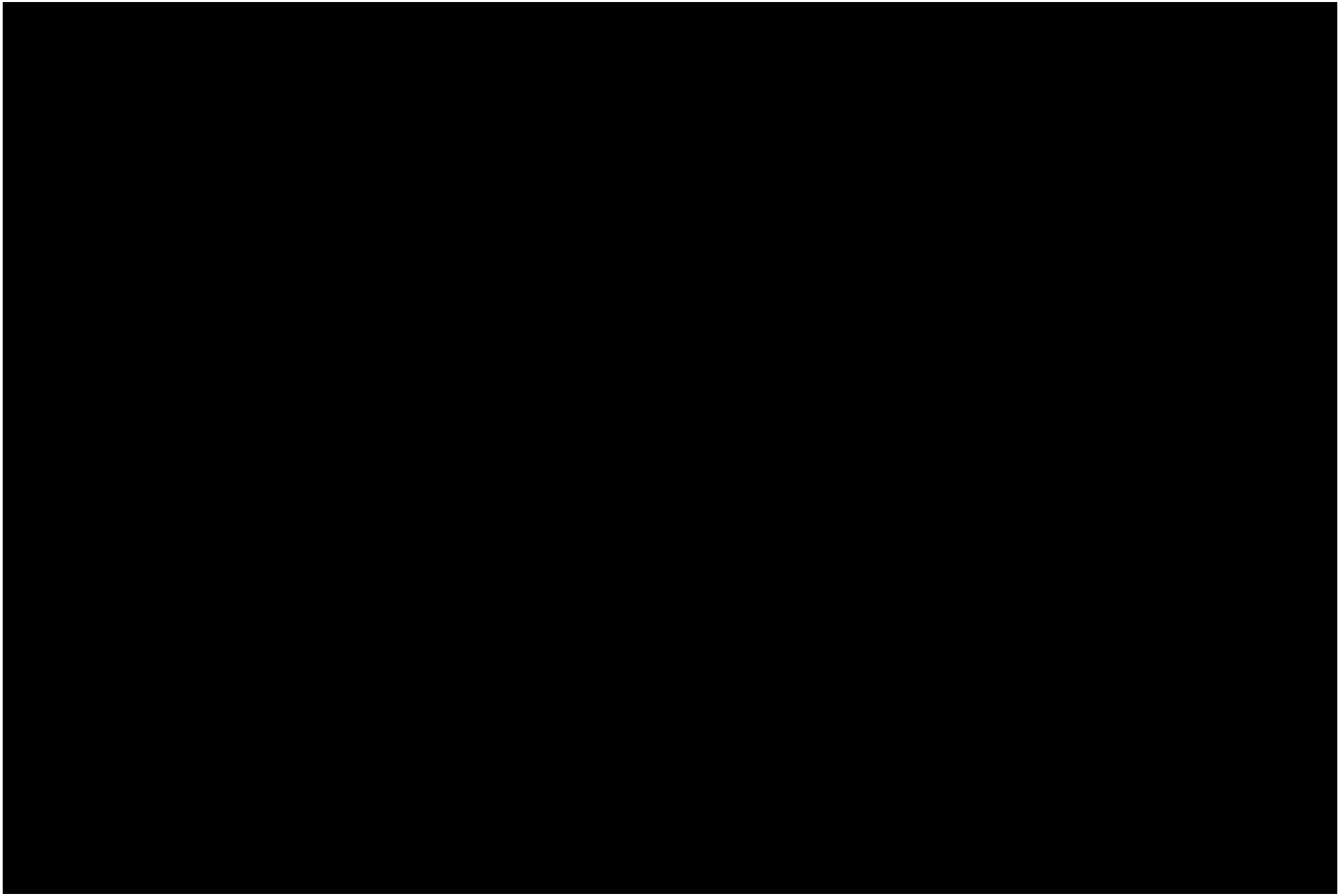


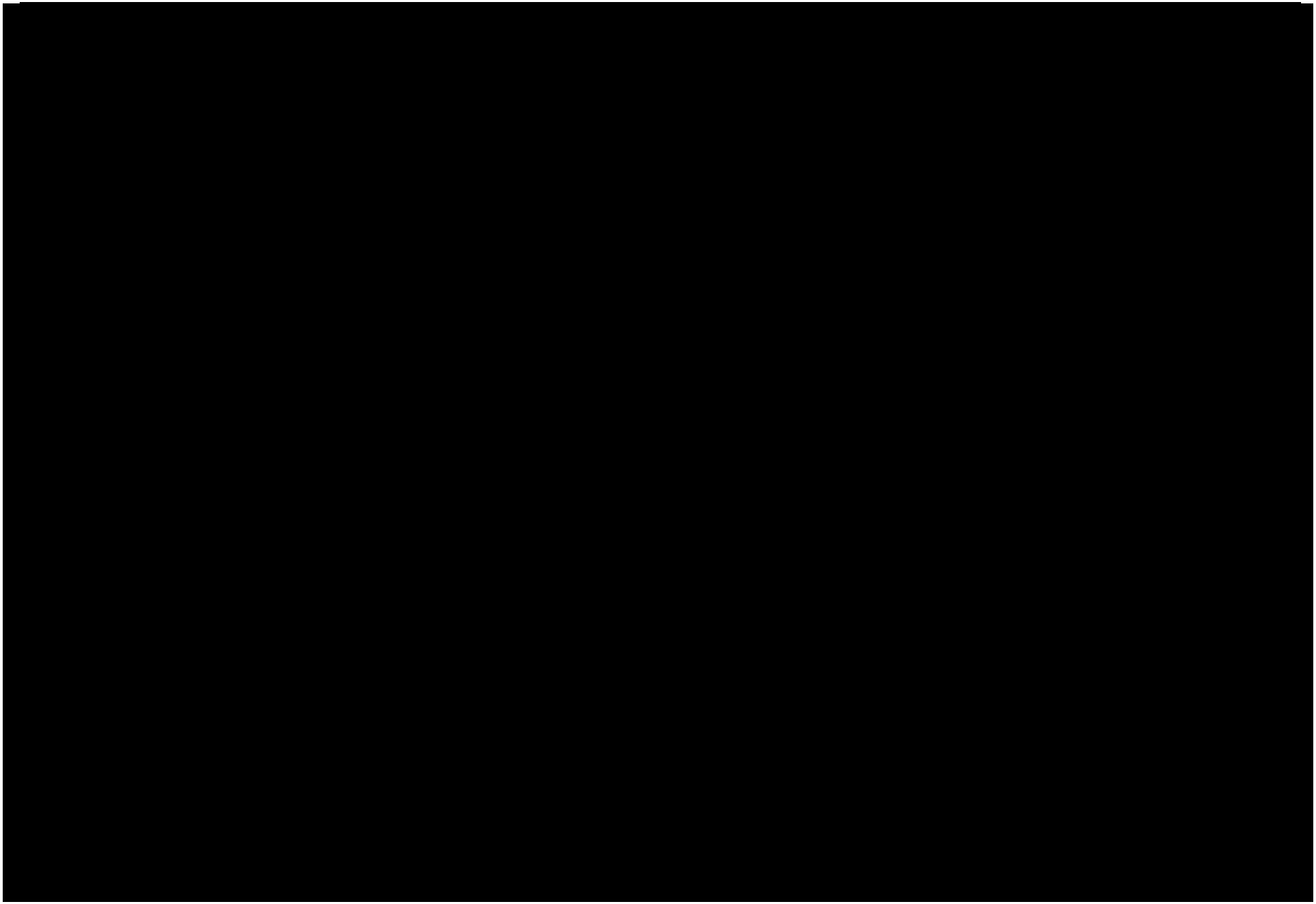


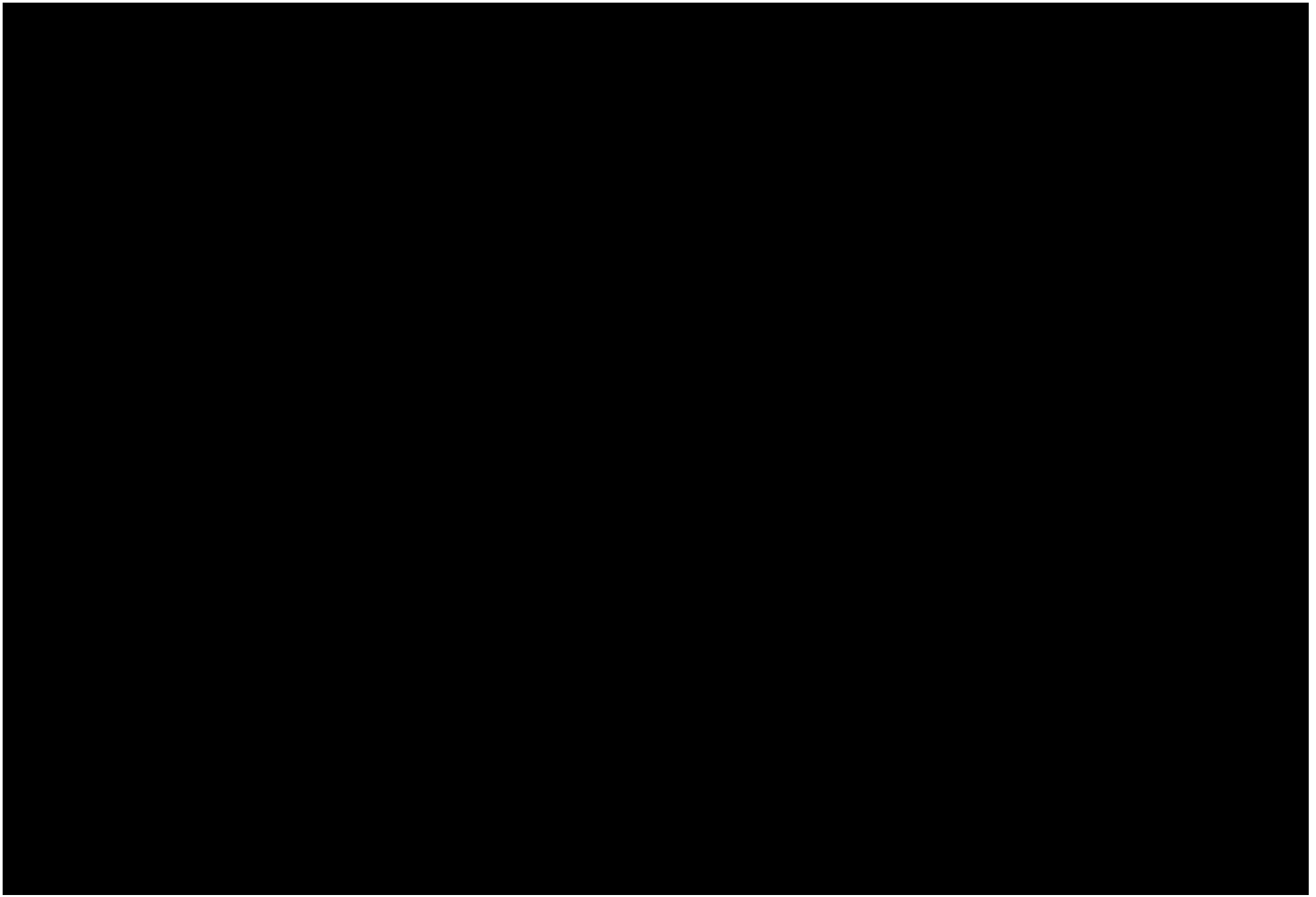


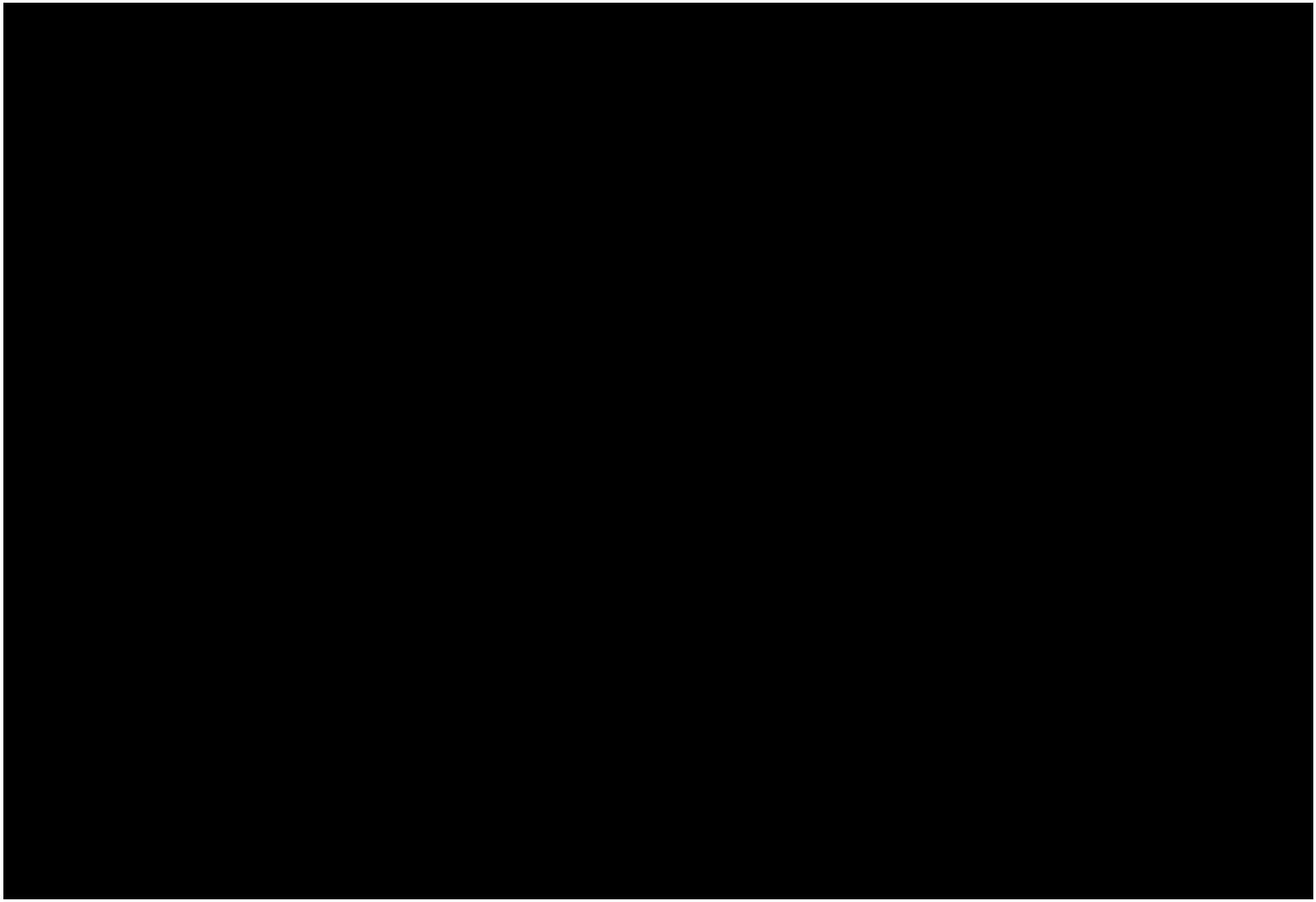


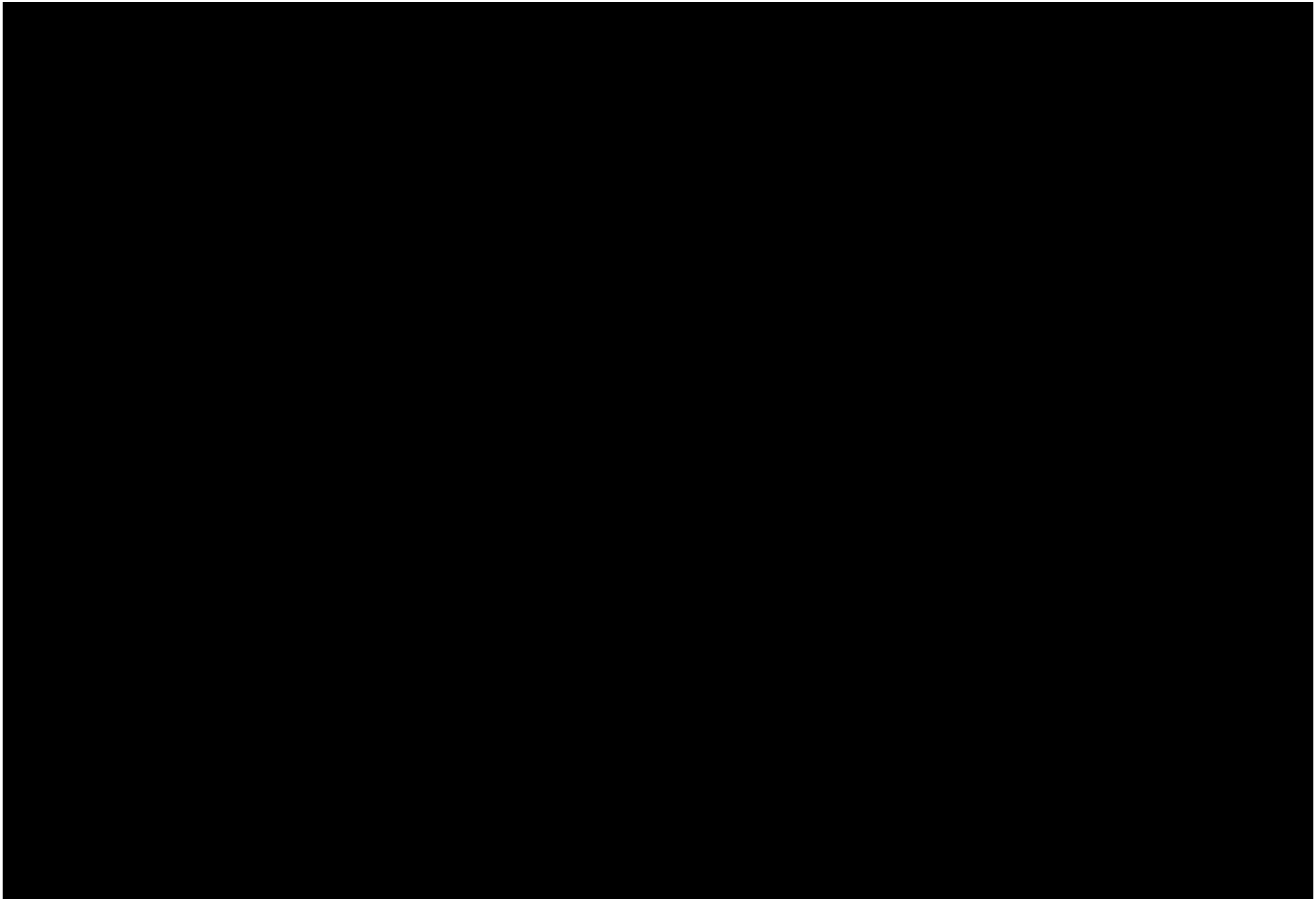


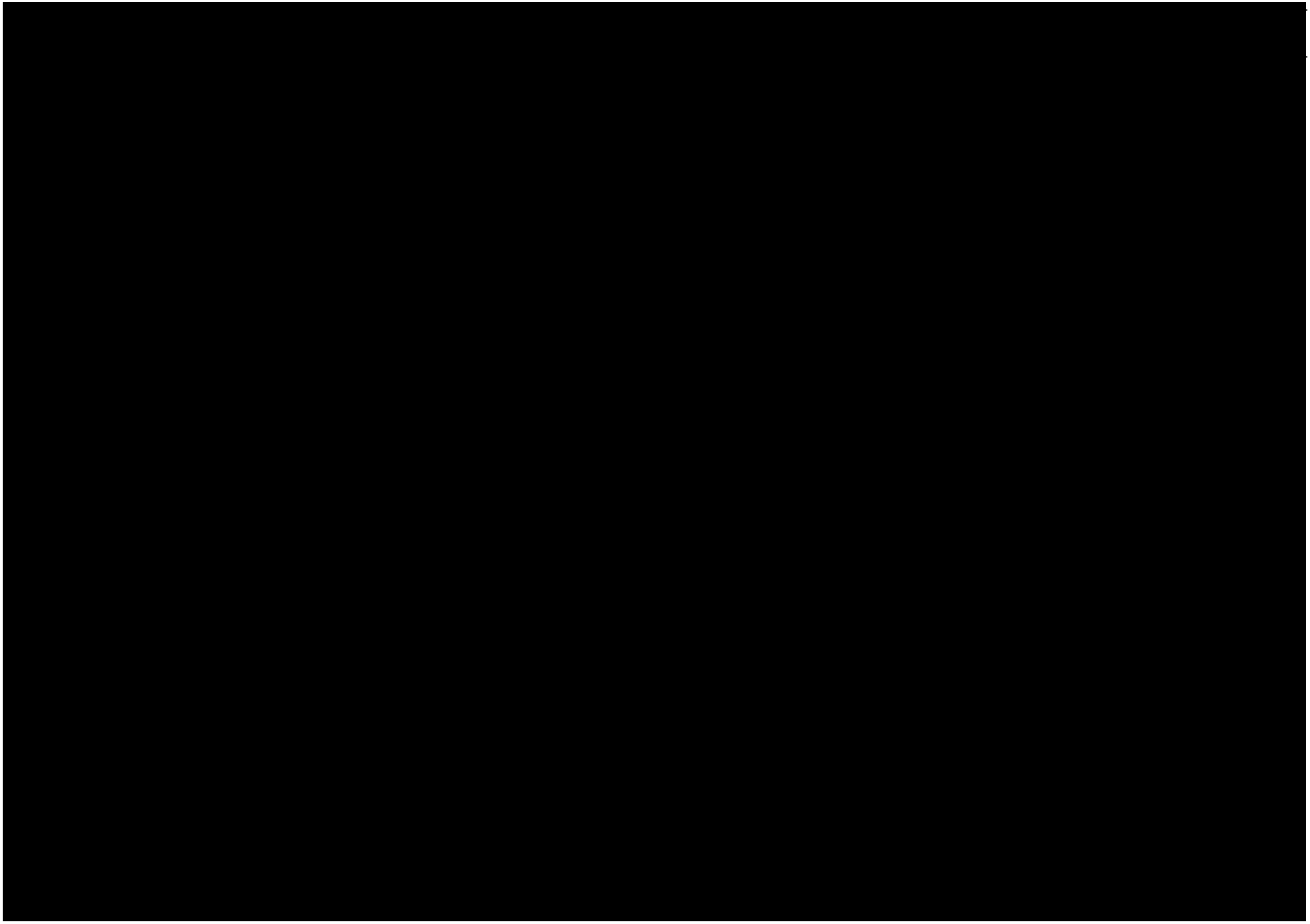


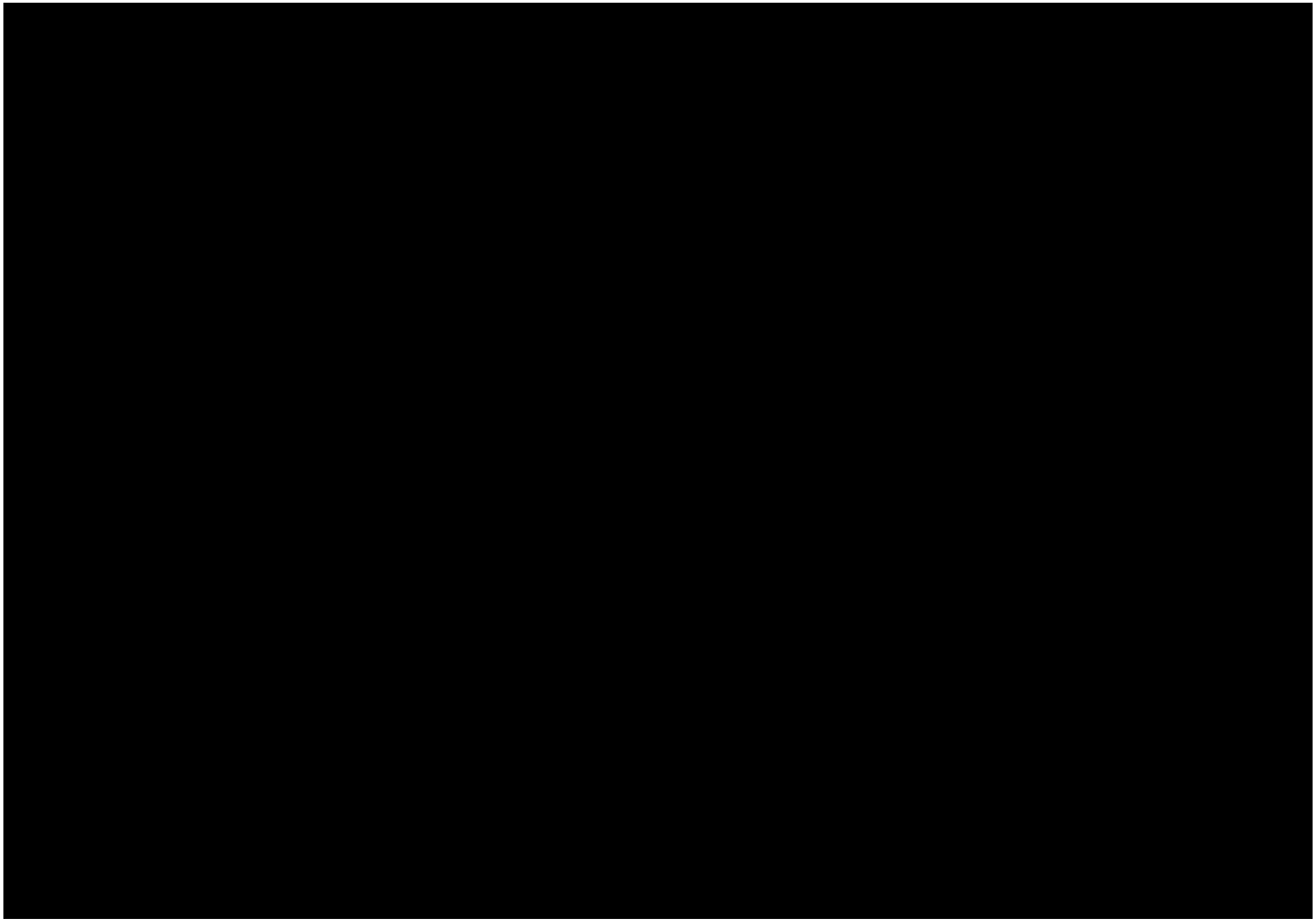


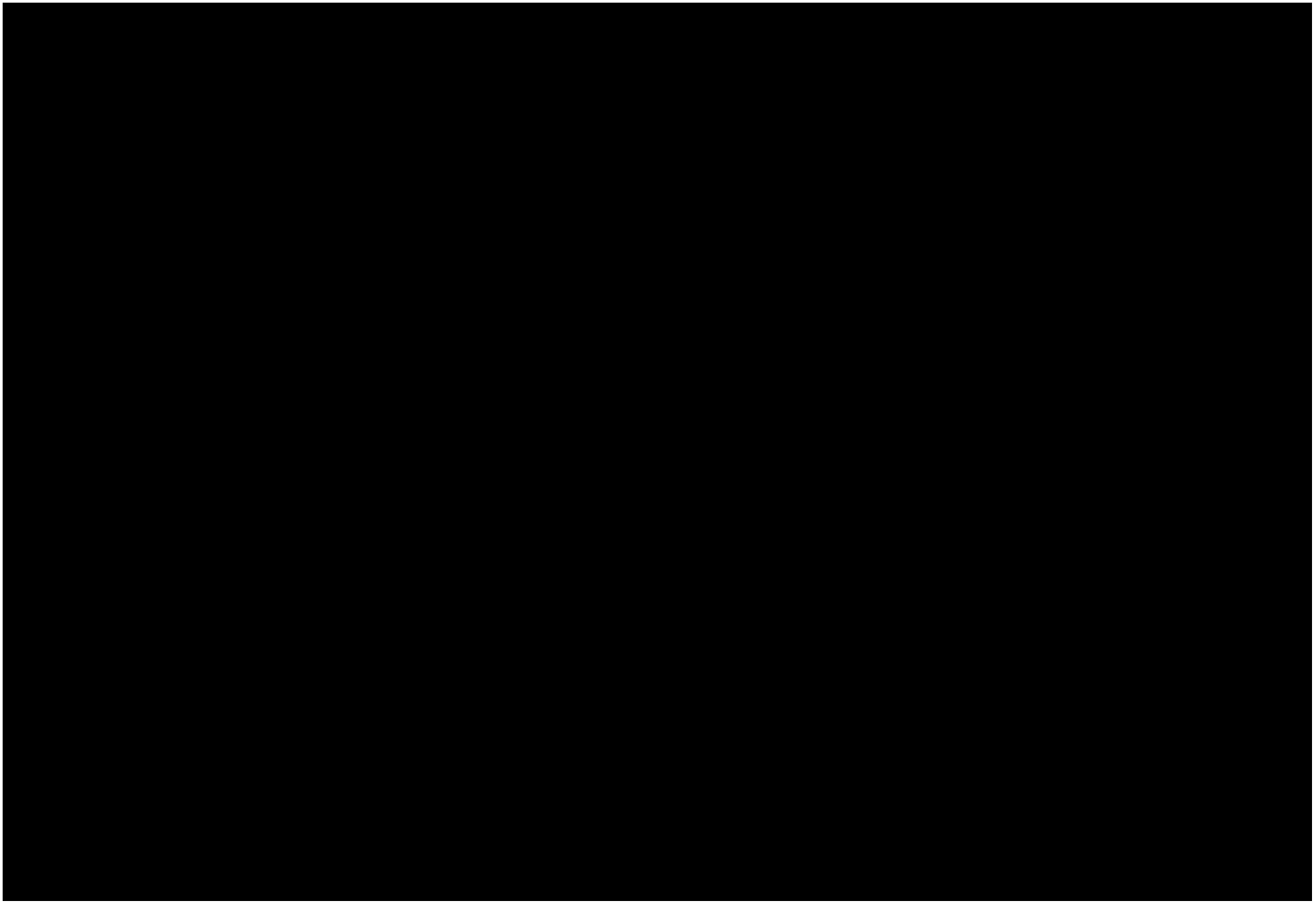


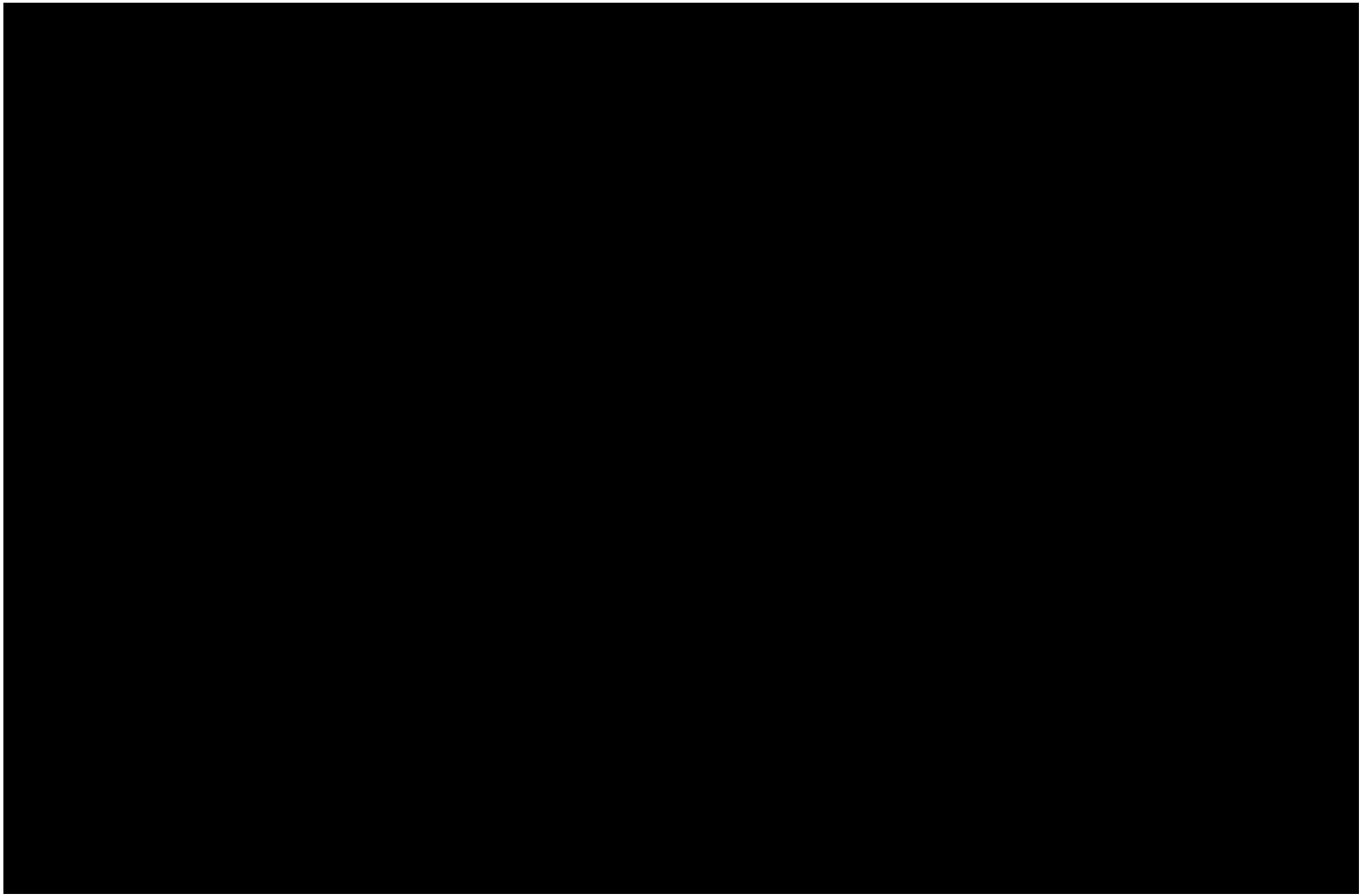


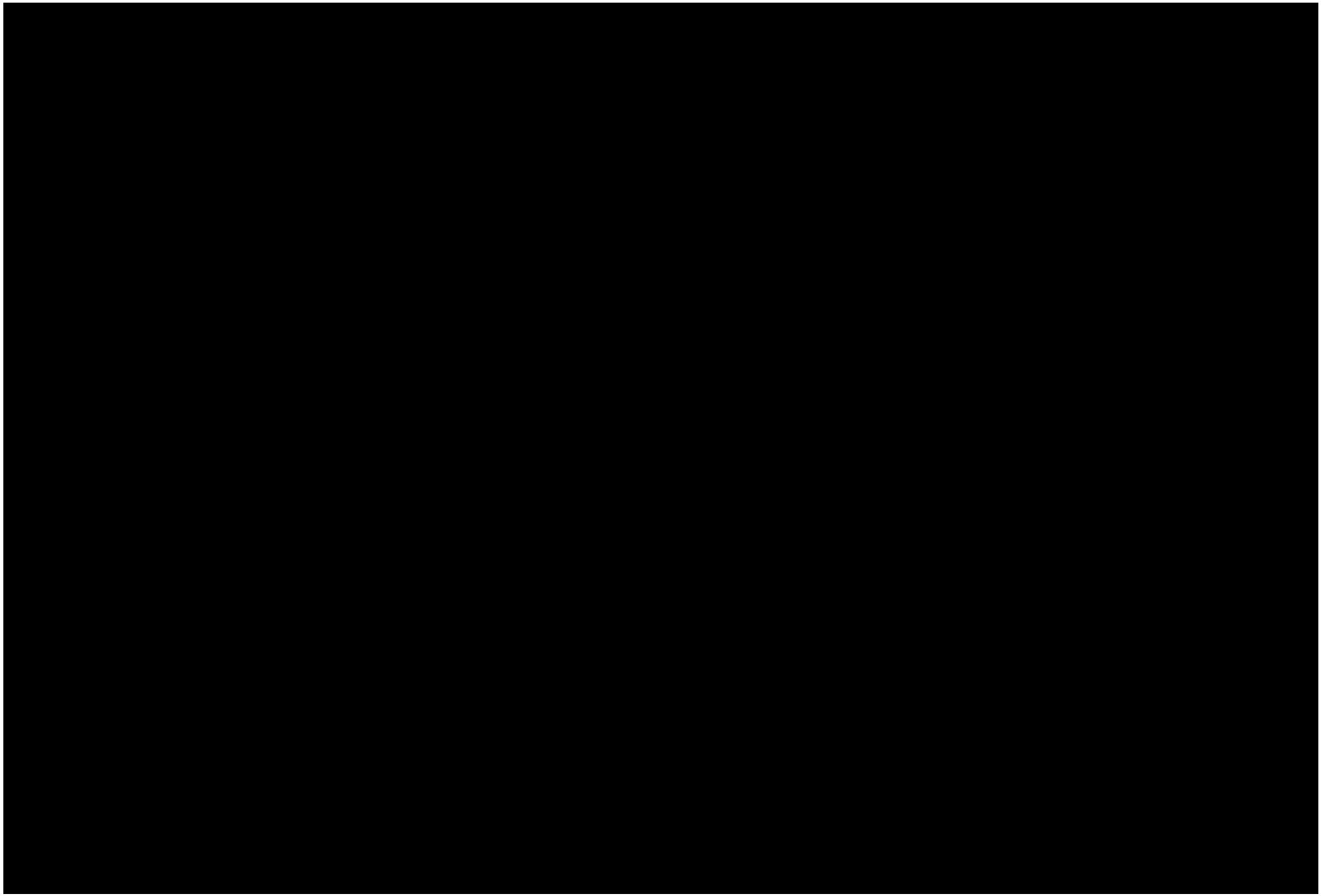


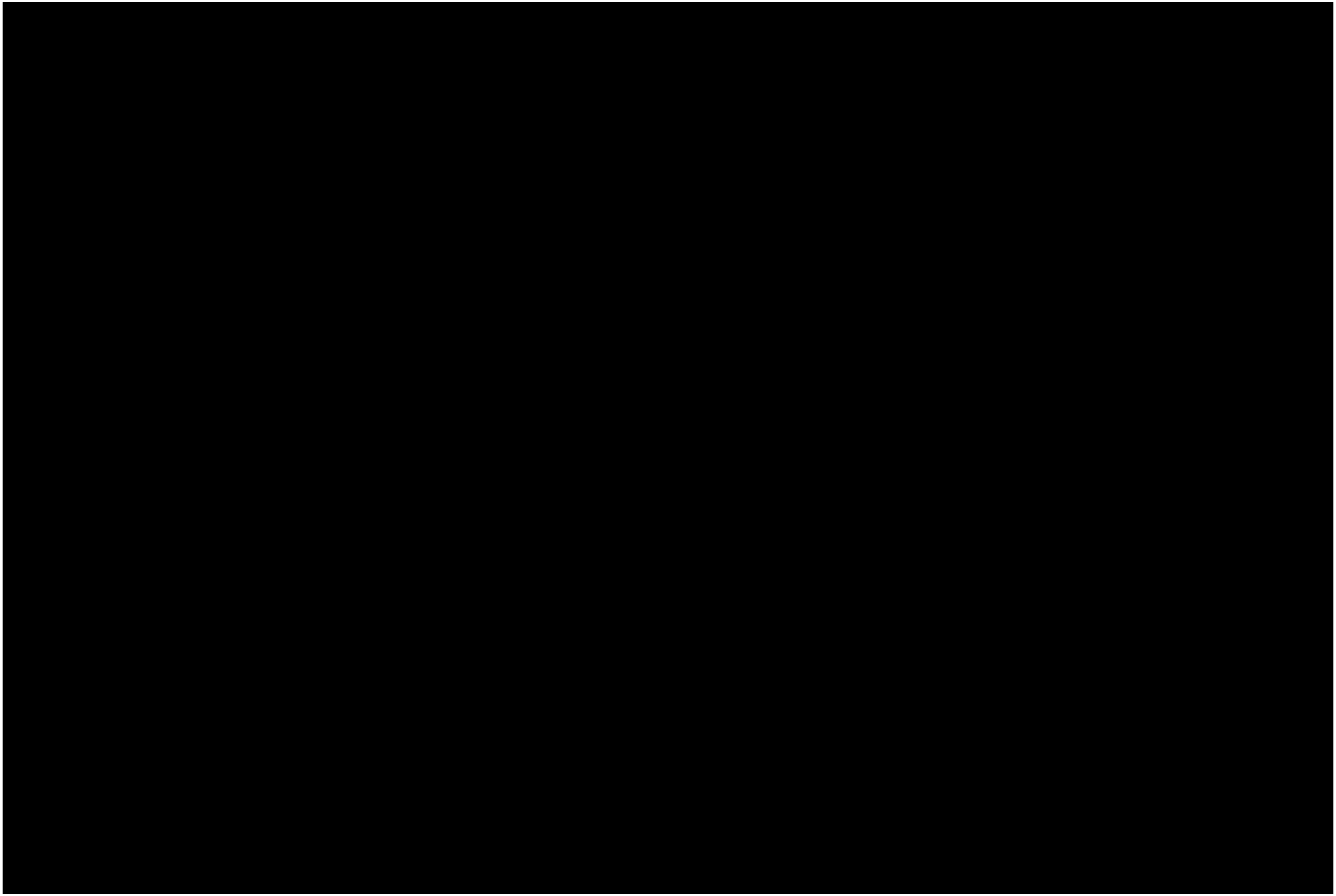












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FLOOD REPORT - NO.5

Scotts Peak Dam - Sunny Day Failure
22.3m at the Judbury Flood Gauge and Mean Sea Level
Peak discharge at Judbury: 23,600m^3/s
HUON RIVER from JUDBURY to WATERLOO (Huon Estuary), including TAHUNE

Notes
~ The flood levels have been estimated using MIKE Flood software and are relative to the Australian Height Datum (m AHD).
~ Upstream of Judbury the MIKE Flood model is one-deimensional based on 1:25,000 topographic map contours.
~ Downstream of Judbury the MIKE Flood model is 2D with the floodplain based on LiDAR from Geoscience Australia and the river channel based on a variety of survey sources.

~ Coordinates are MGA (Map Grid of Australia), Zone 55.
~ For zones, refer to Appendix C of the FEP.

~ Emergency services should check maps (e.g. Street Atlas) for nearby properties that may be affected.
~ Buildings with floor levels greater than 1.0m above the predicted flood level are not included in this table.

Maximum Flood Levels at Bridges

	(m gauge)	(m AHD)
Tahune Bridge	26.2	71.0
Weld Rd Bridge	Not estimated	
Judbury Bridge	22.3	33.2
Huonville Bridge	15.8	14.4

Summary of flooded infrastructure

Bridges

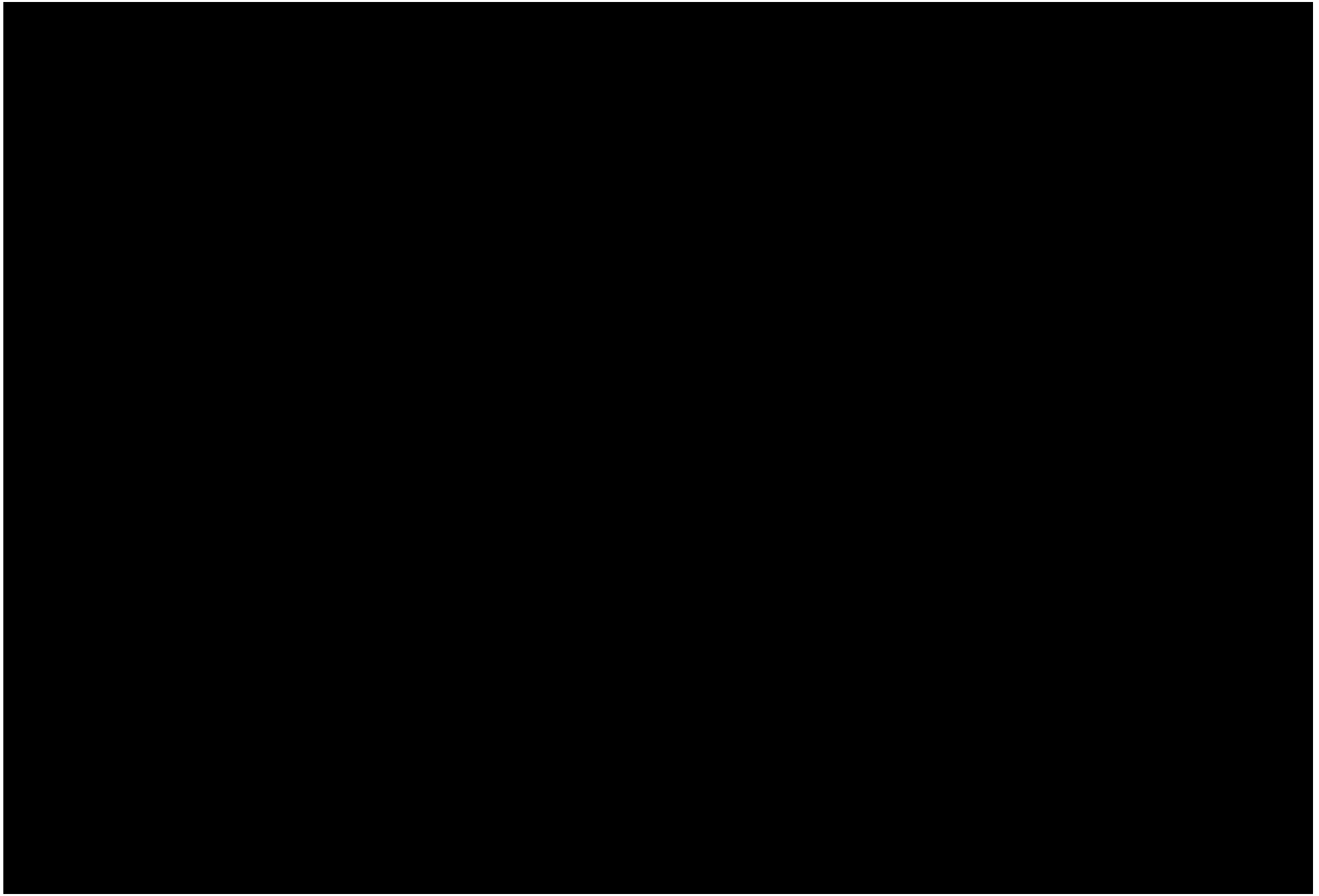
	Roads	Easting	Northing	Estimated depth (m)	Comment
1	Channel Highway	504420	5235080	Greater than 1m	Significant length of Highway inundated between Huonville and Cradoc Hill Road
2	Wilmot Road near Mountain Creek bridge	503411	5237036	Greater than 1m	Inundated for full length.
3	Glen Huon Road, approx 1km from Huon Bridge	503012	5236139	Greater than 1m	Inundated at numerous locations along its length.
4	Huon Highway	502008	5236183	Greater than 1m	Significant length of Highway inundated between Huonville and Port Huon.
5	Huonville	503870	5235590	Greater than 1m	All roads and streets in Huonville town centre inundated.

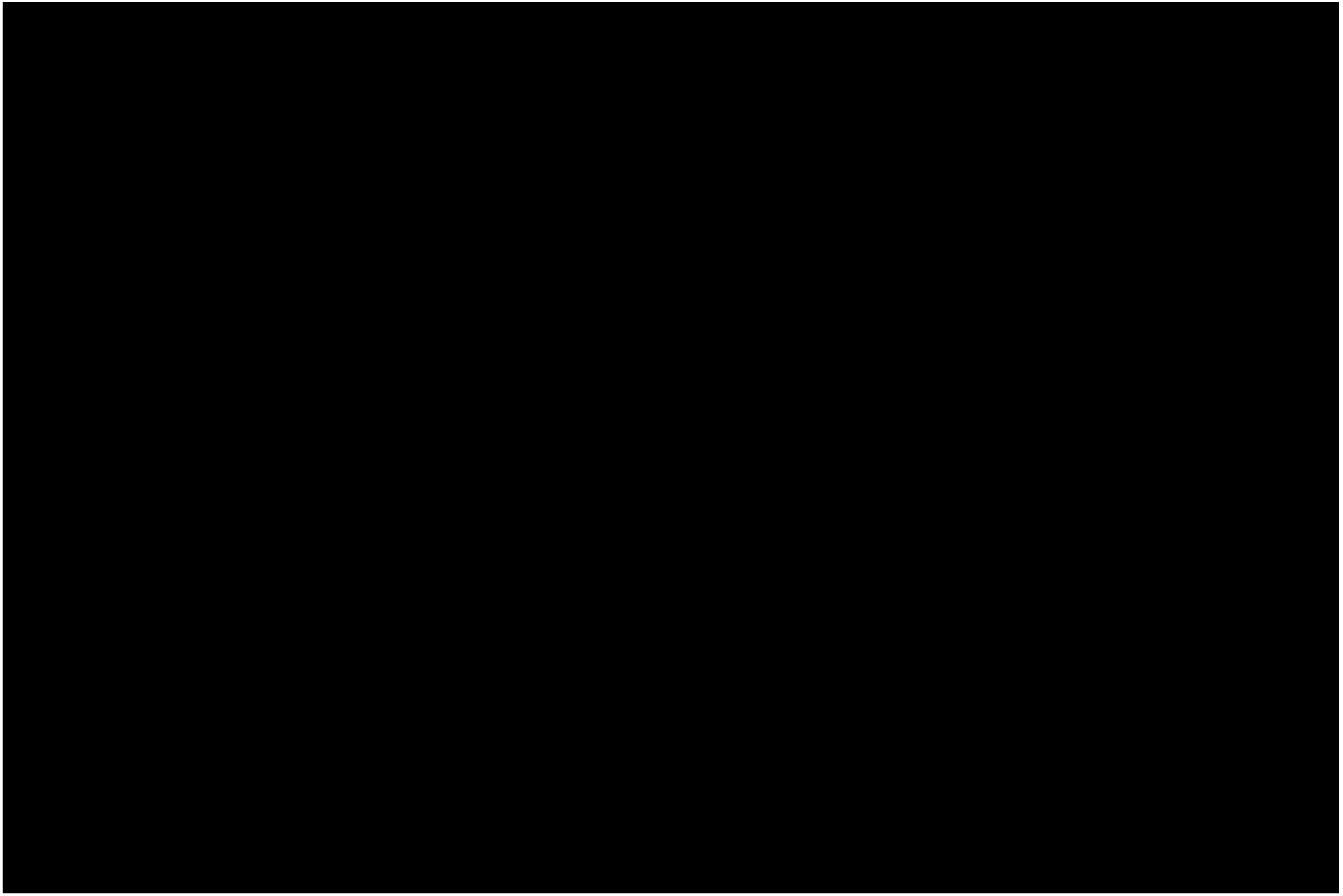
	Bridges	Easting	Northing	Estimated depth (m)	Comment
1	Tahune Bridge	477907	5228581	20.1	Bridge overtopped - likely to be washed away.
2	Weld Rd Bridge	485244	5232805		Bridge overtopped - likely to be washed away.
3	Judbury Bridge	494165	5239266	11.5	Bridge overtopped - likely to be washed away.
4	Huonville Bridge	503785	5235423	10.3	Bridge overtopped - likely to be washed away.

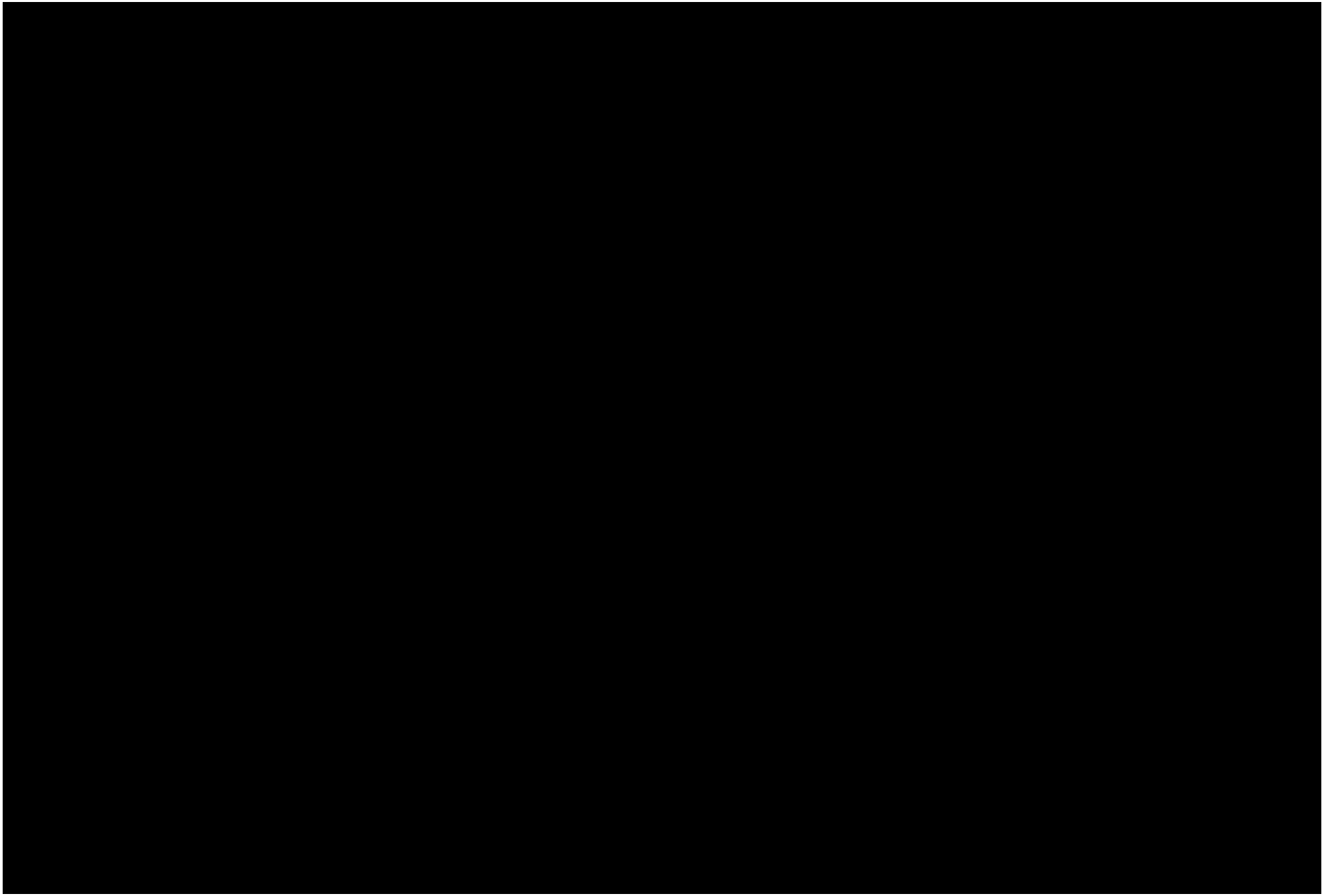
1. Tahune bridge deck level: 50.9 m AHD approx
2. Weld Road bridge deck level: 39.7 m AHD from SPM10617
3. Judbury bridge deck level: 21.71 m AHD from SPM9697 (southern side of bridge). SPM = State Permanent Mark (survey mark).
4. Huonville Bridge deck level: 4.12 m AHD, HTC Survet Station 680 (northern side of bridge at intersection with Channel Highway).

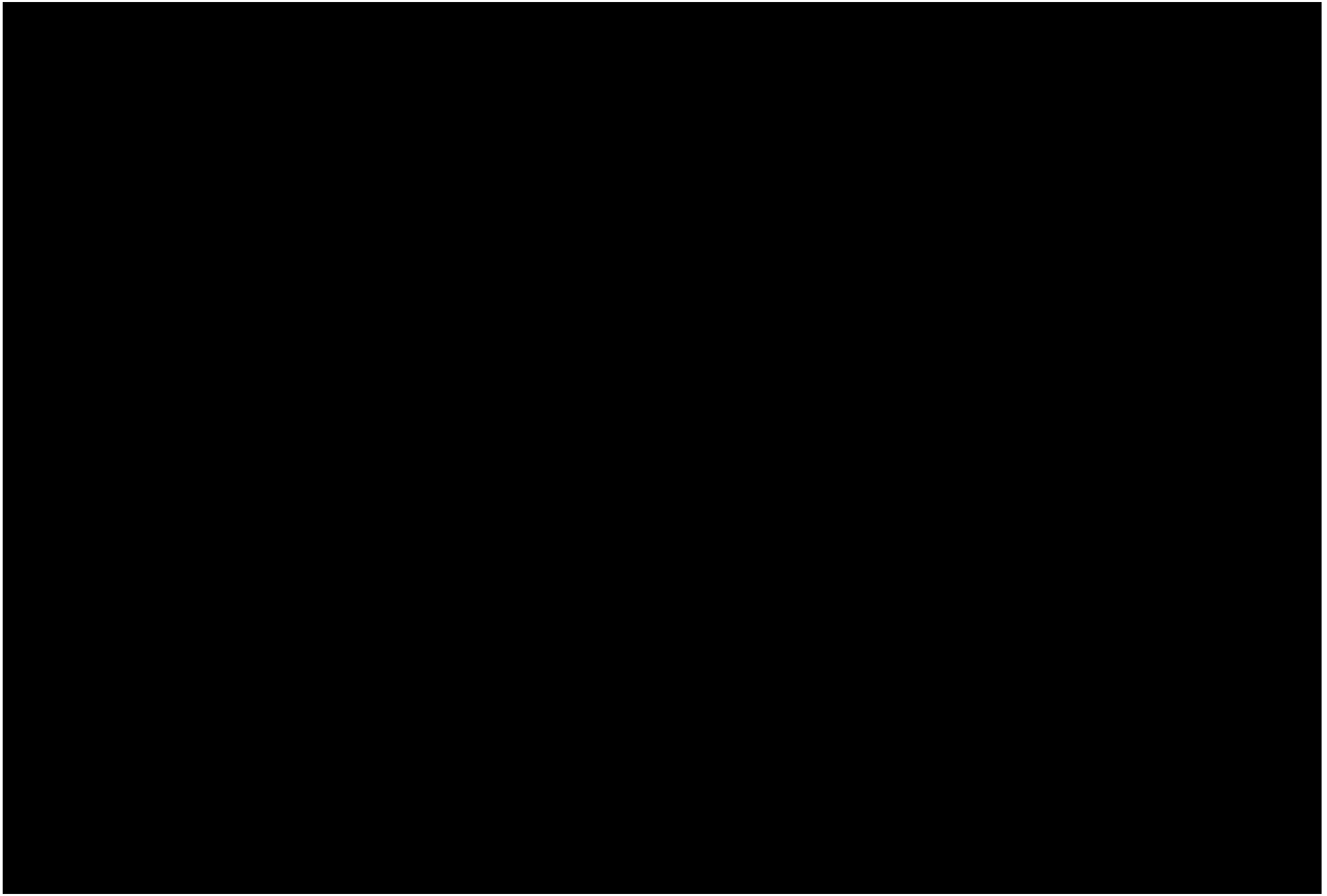
Summary of number of properties threatened

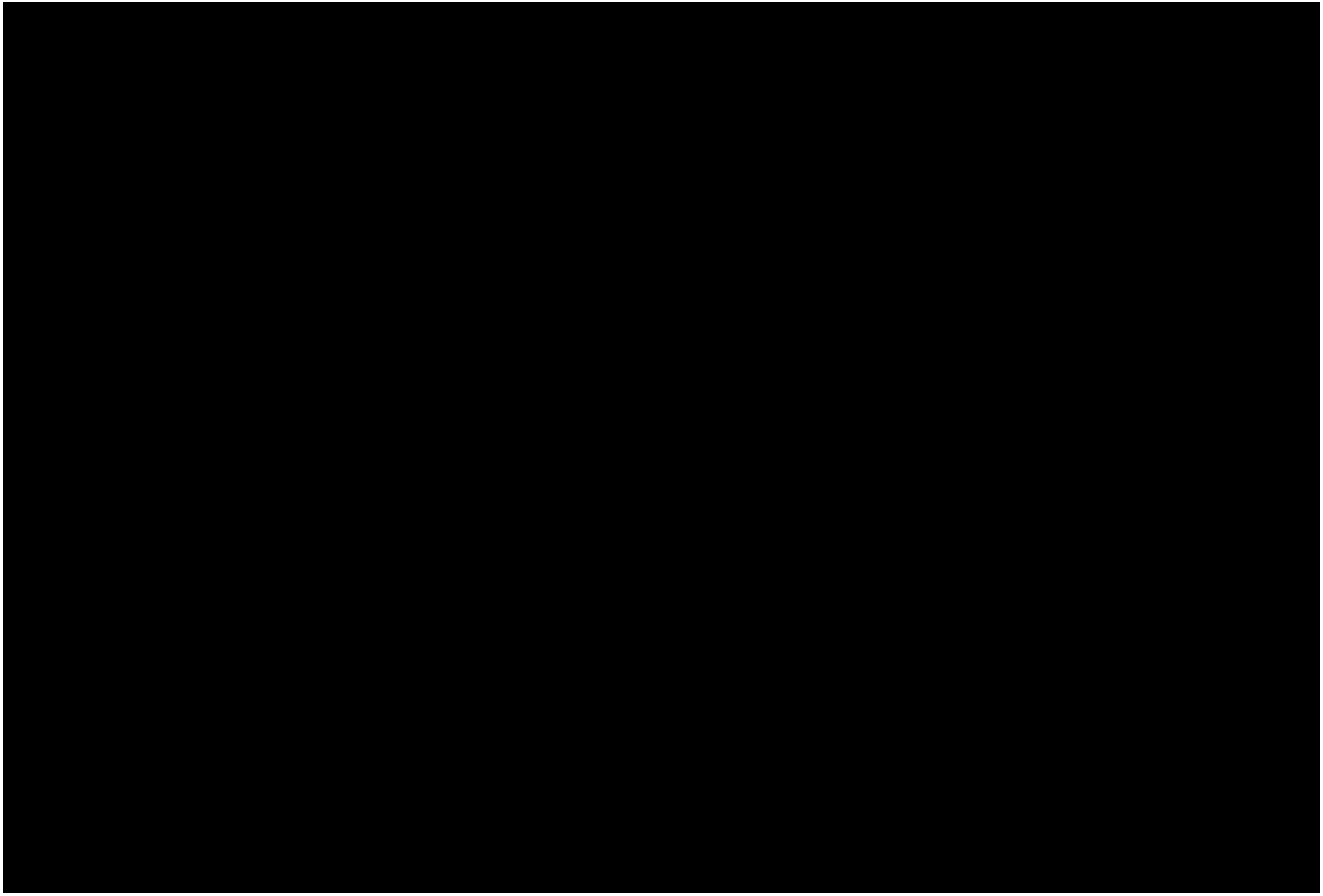
Zone	Area Name	No.
A	Judbury area including Tahune (north of Huon River)	18
B	Judbury-Glen Huon area (south of Huon River)	51
C	Ranelagh	40
D	Wilmot Street, Huonville (past school oval)	68
E	Main Street, Huonville (north of Shield Street)	132
F	Central Huonville	370
G	Flood Road area (eastern Huonville)	82
H	Franklin area, Huon Highway	176
I	Channel Highway	13
J	South of Castle Forbes Bay, Huon Highway	2
K	Cygnet Coast Road (southern section)	3
	Total	955

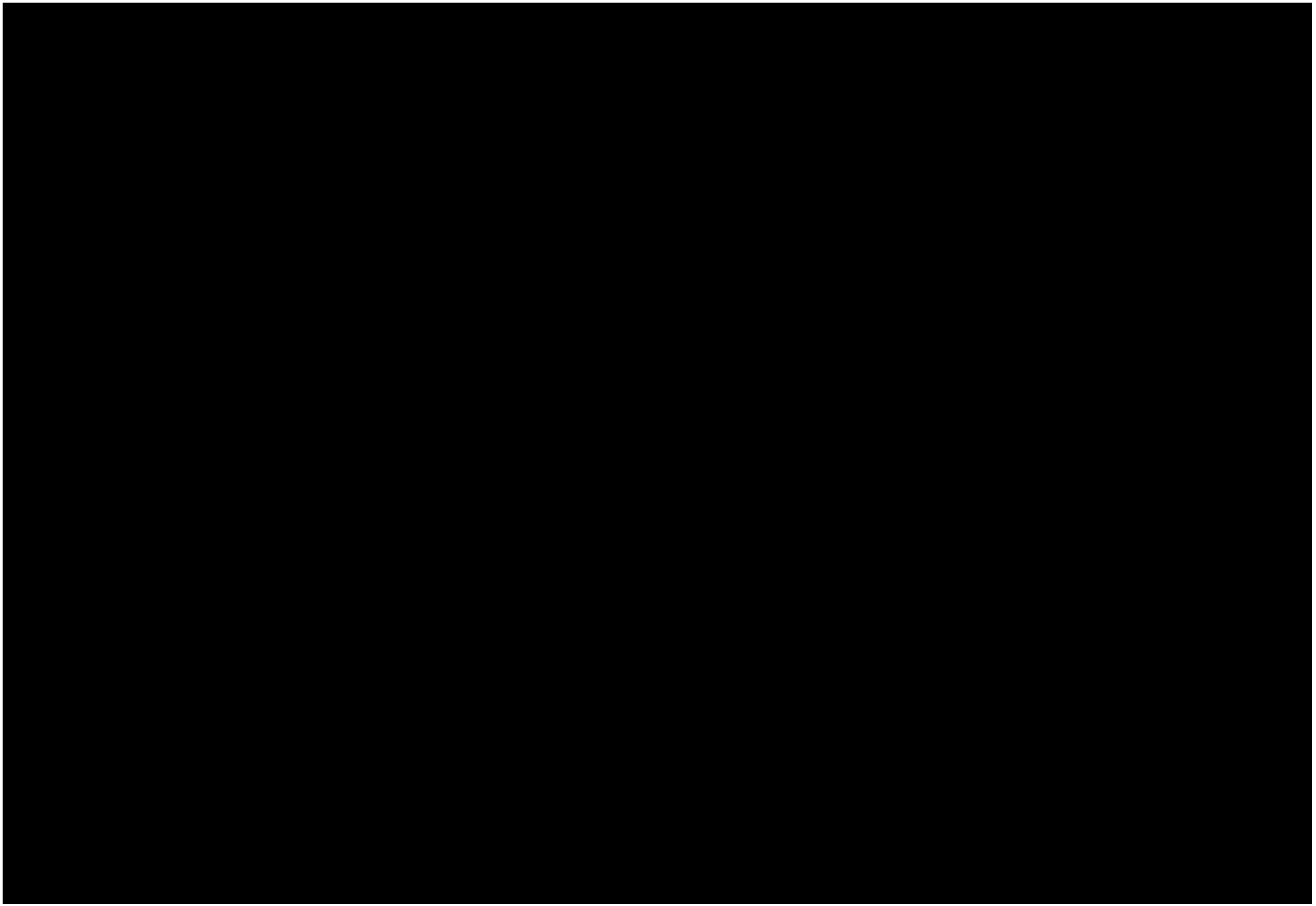


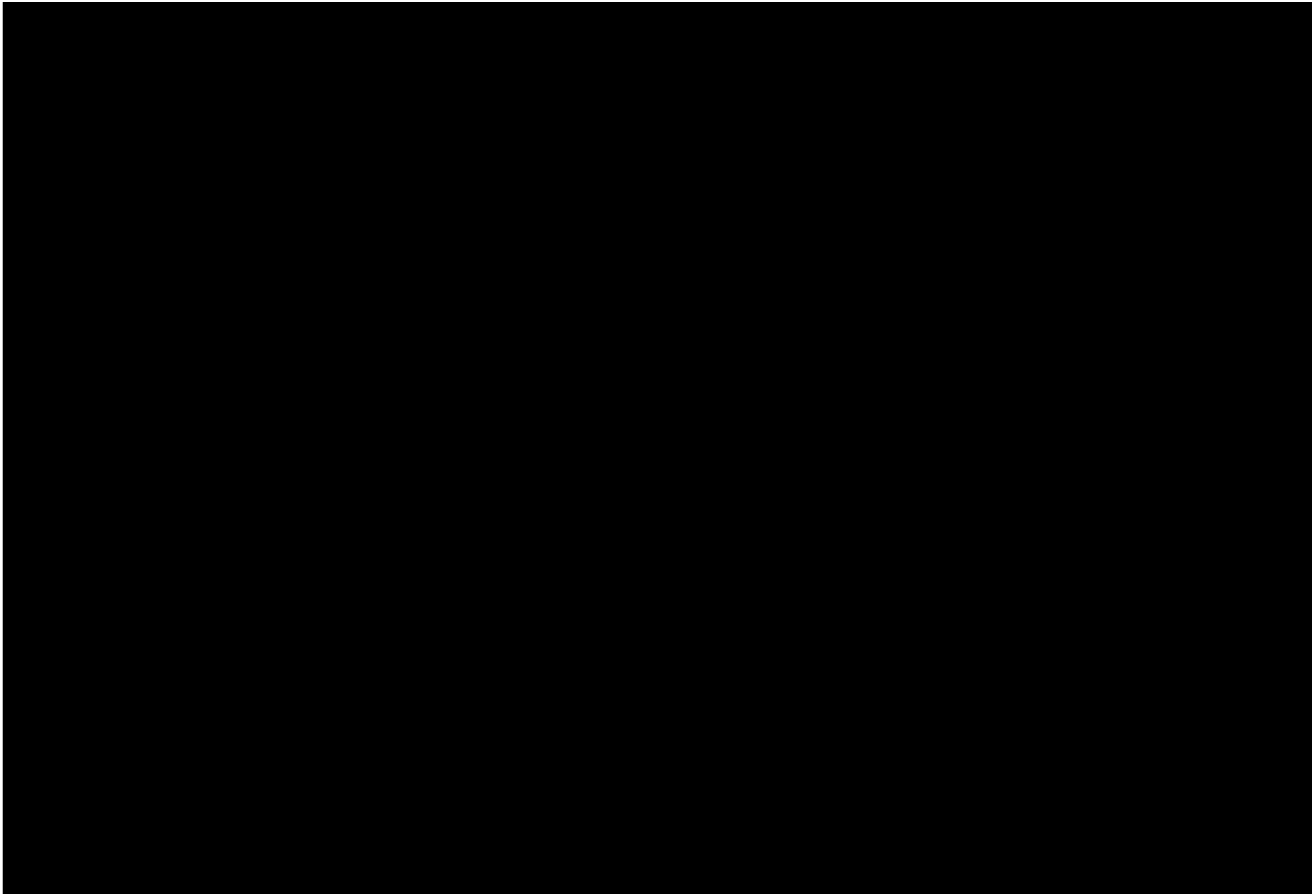


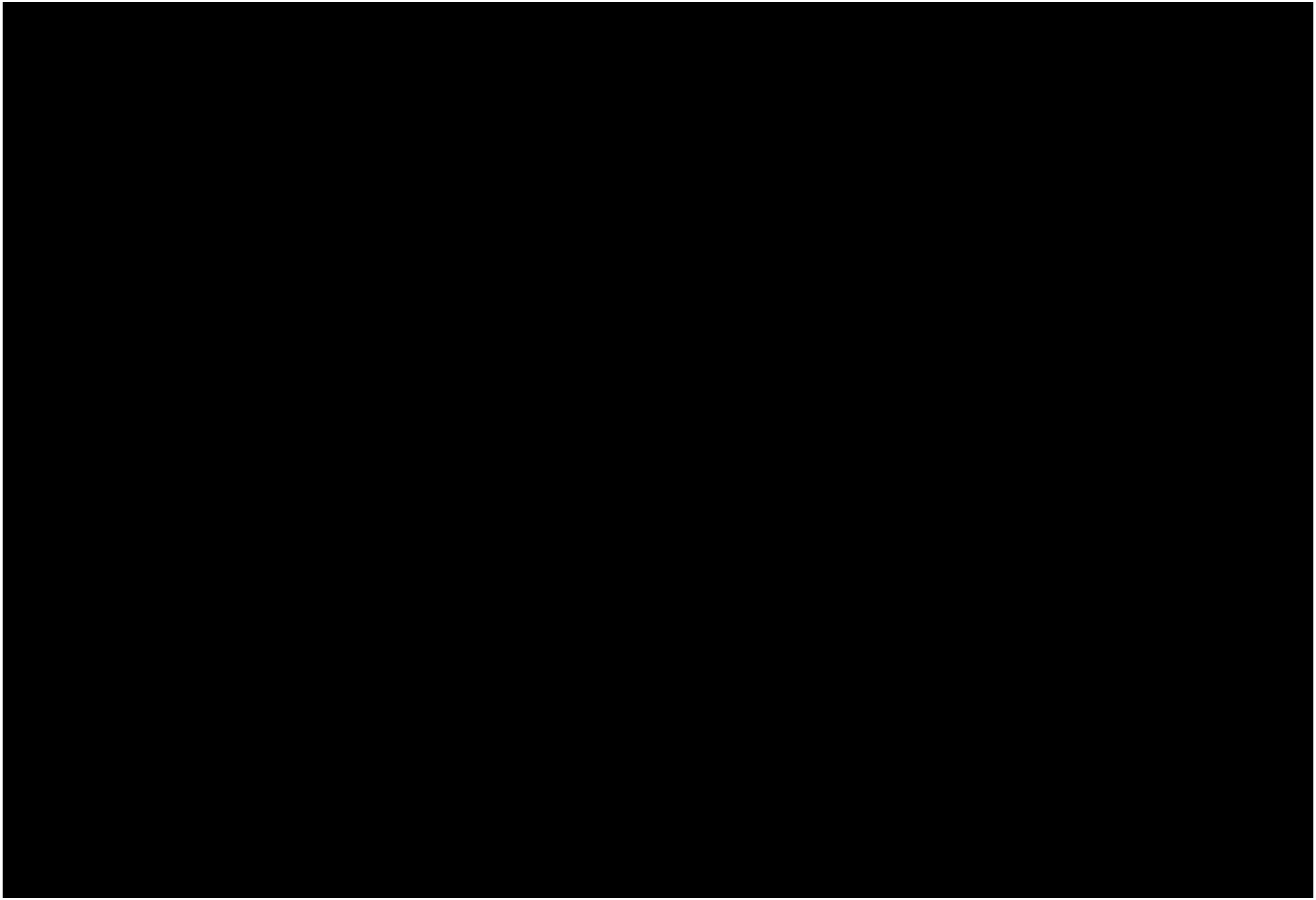


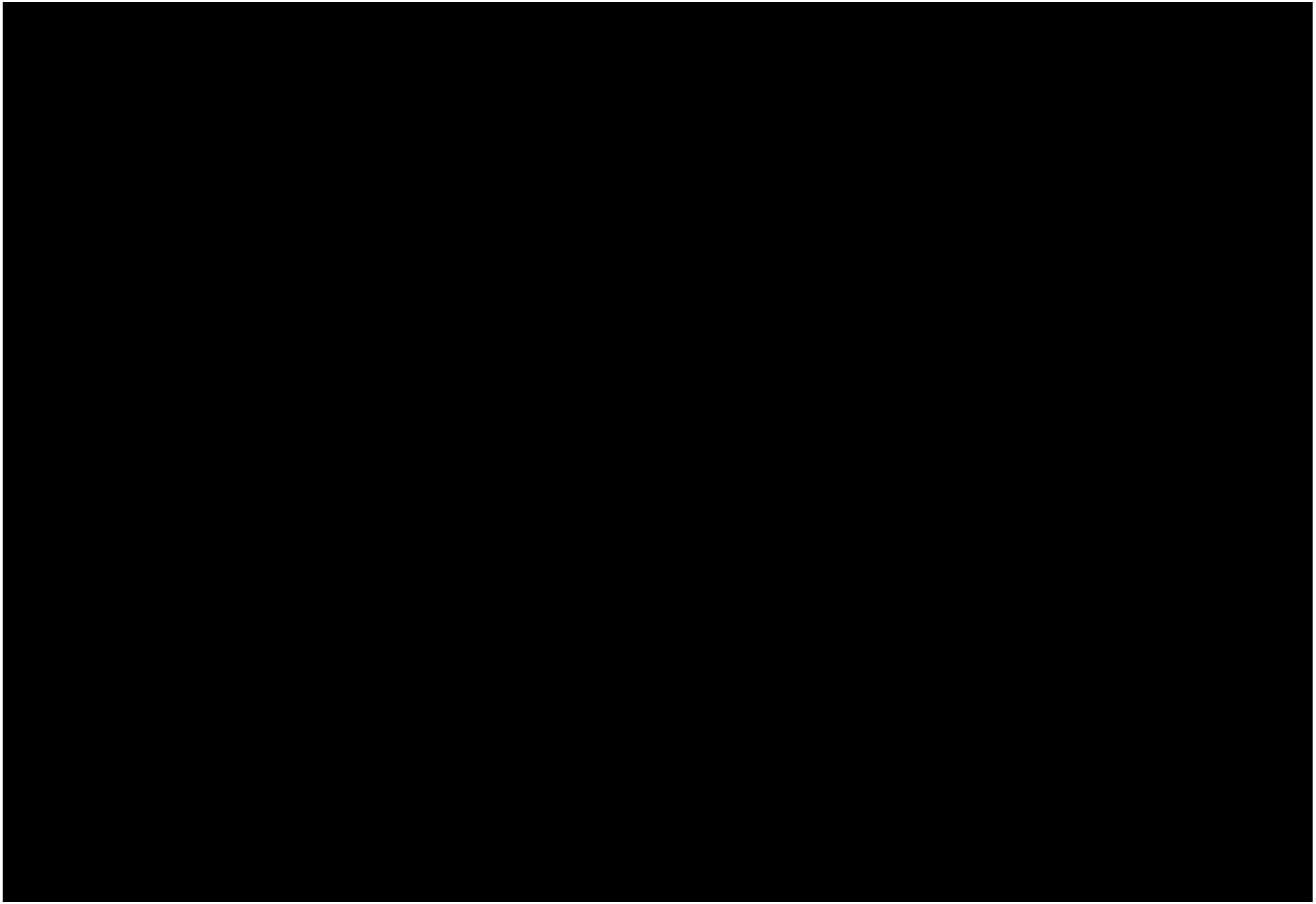


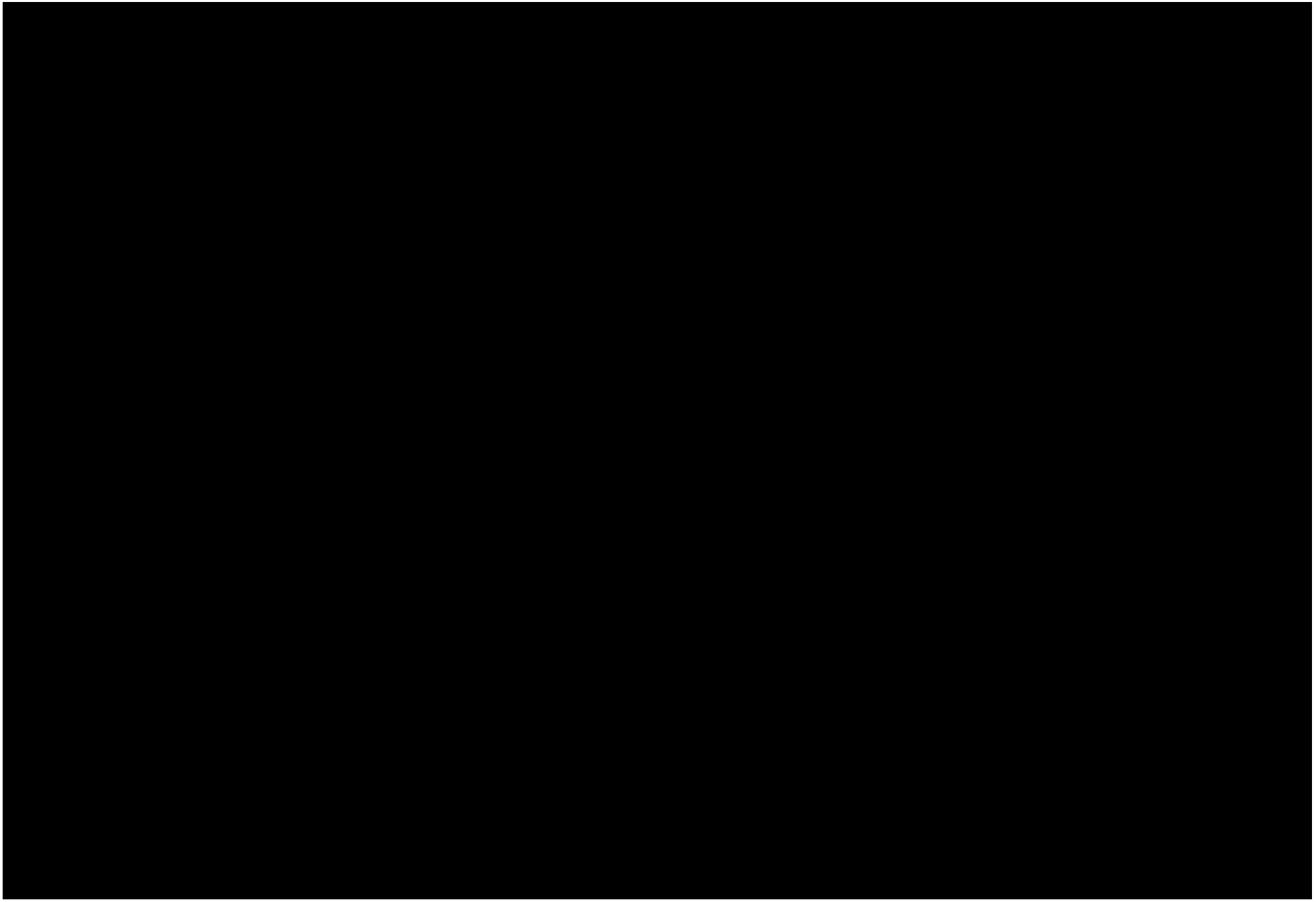


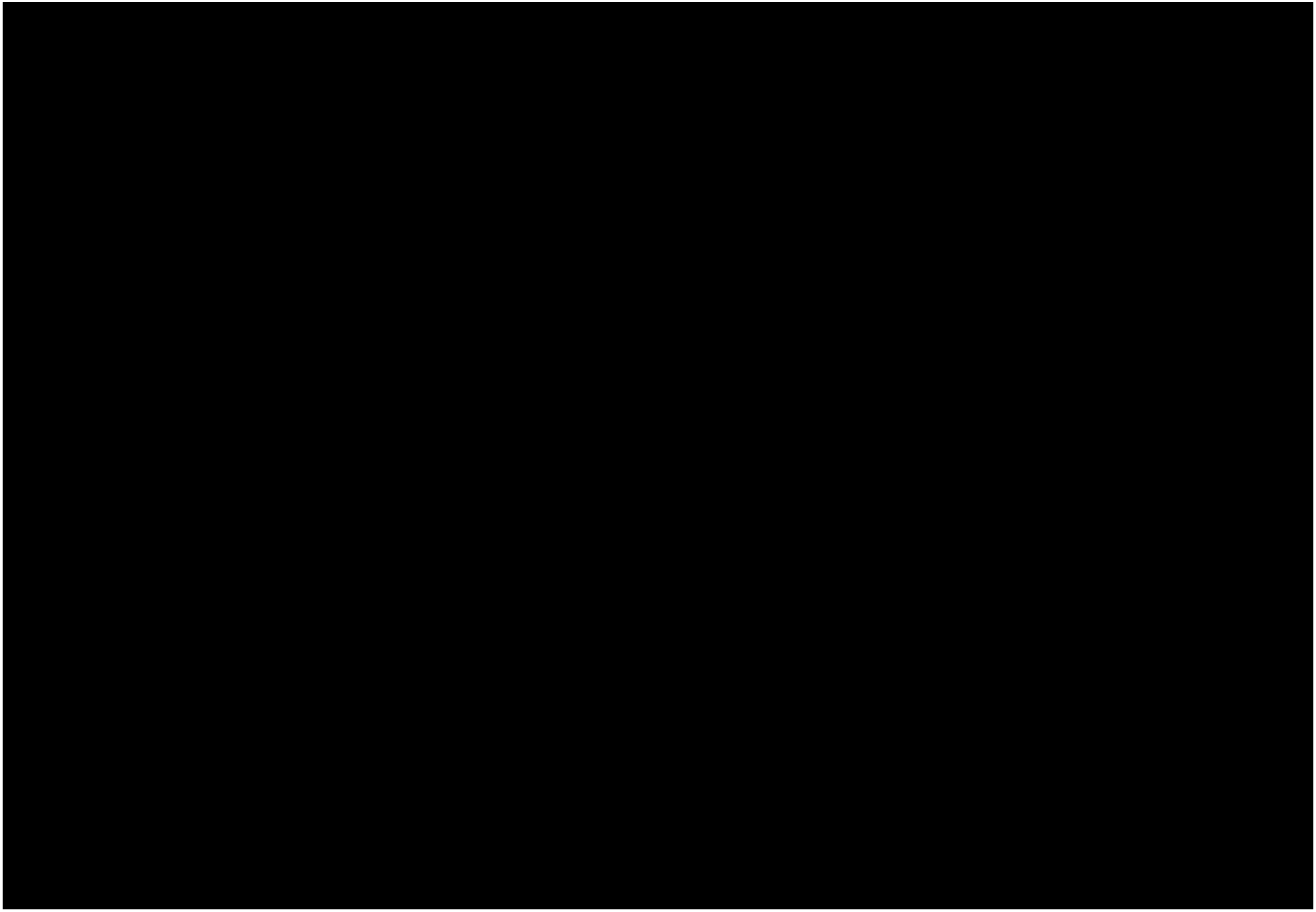


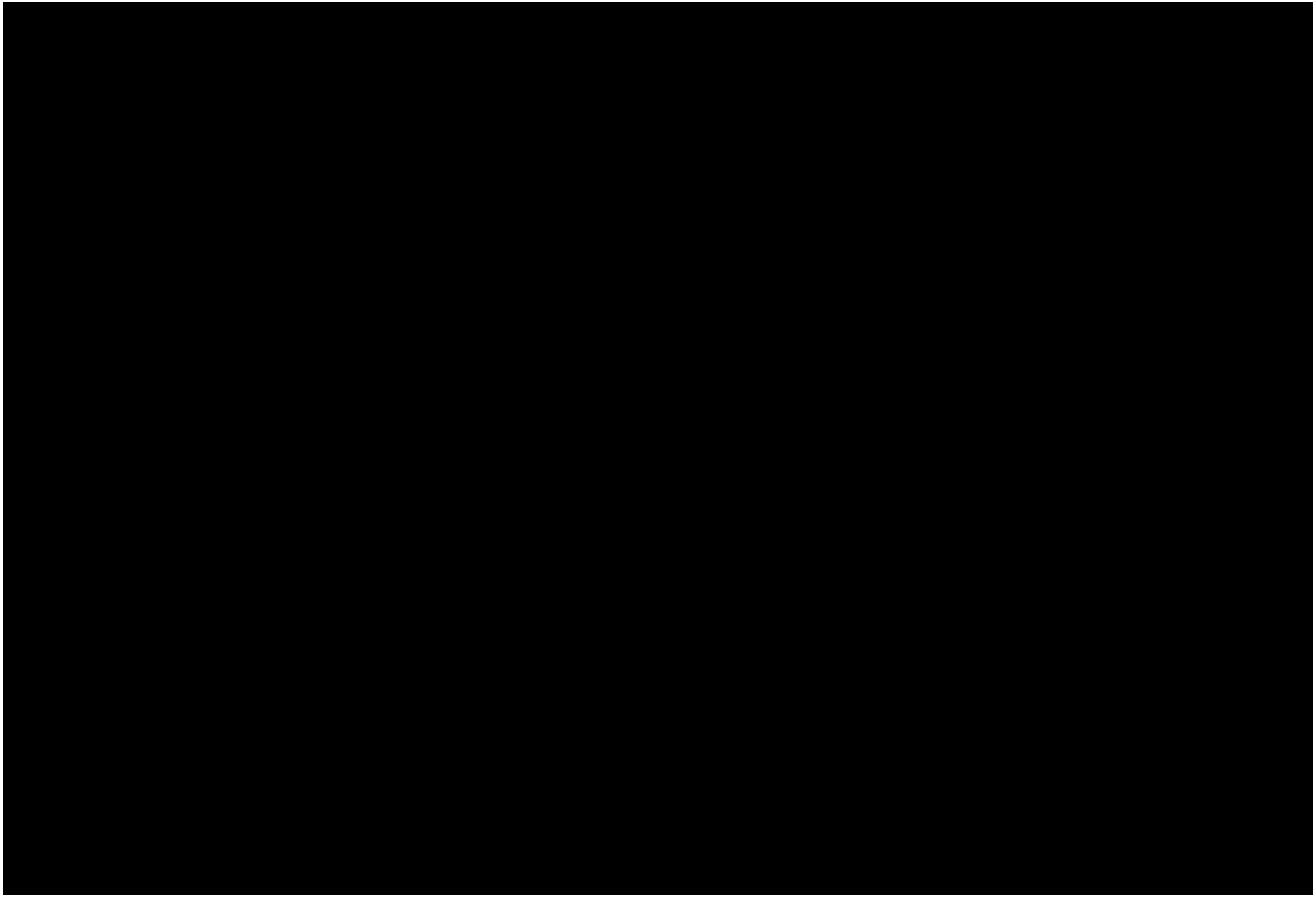


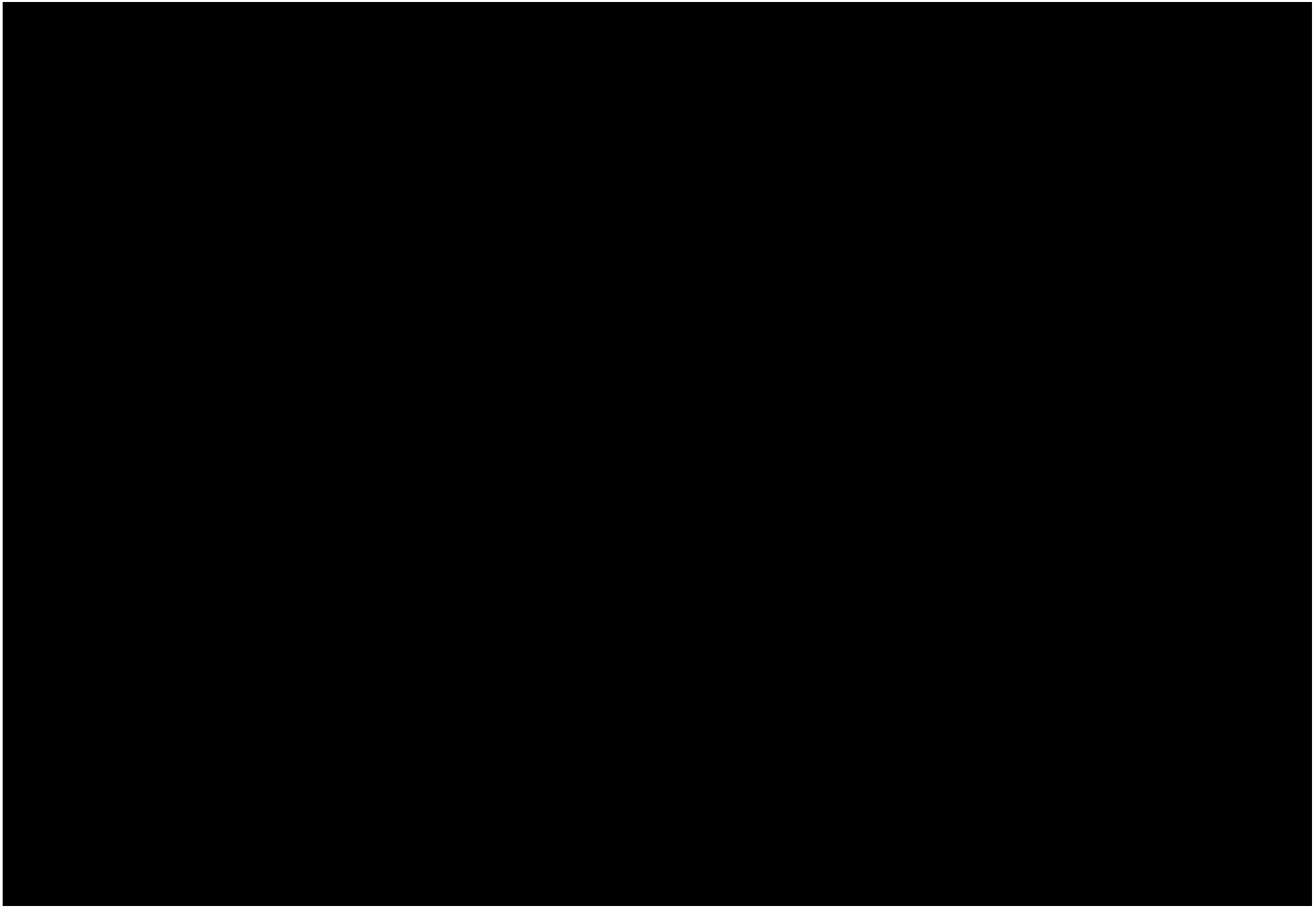


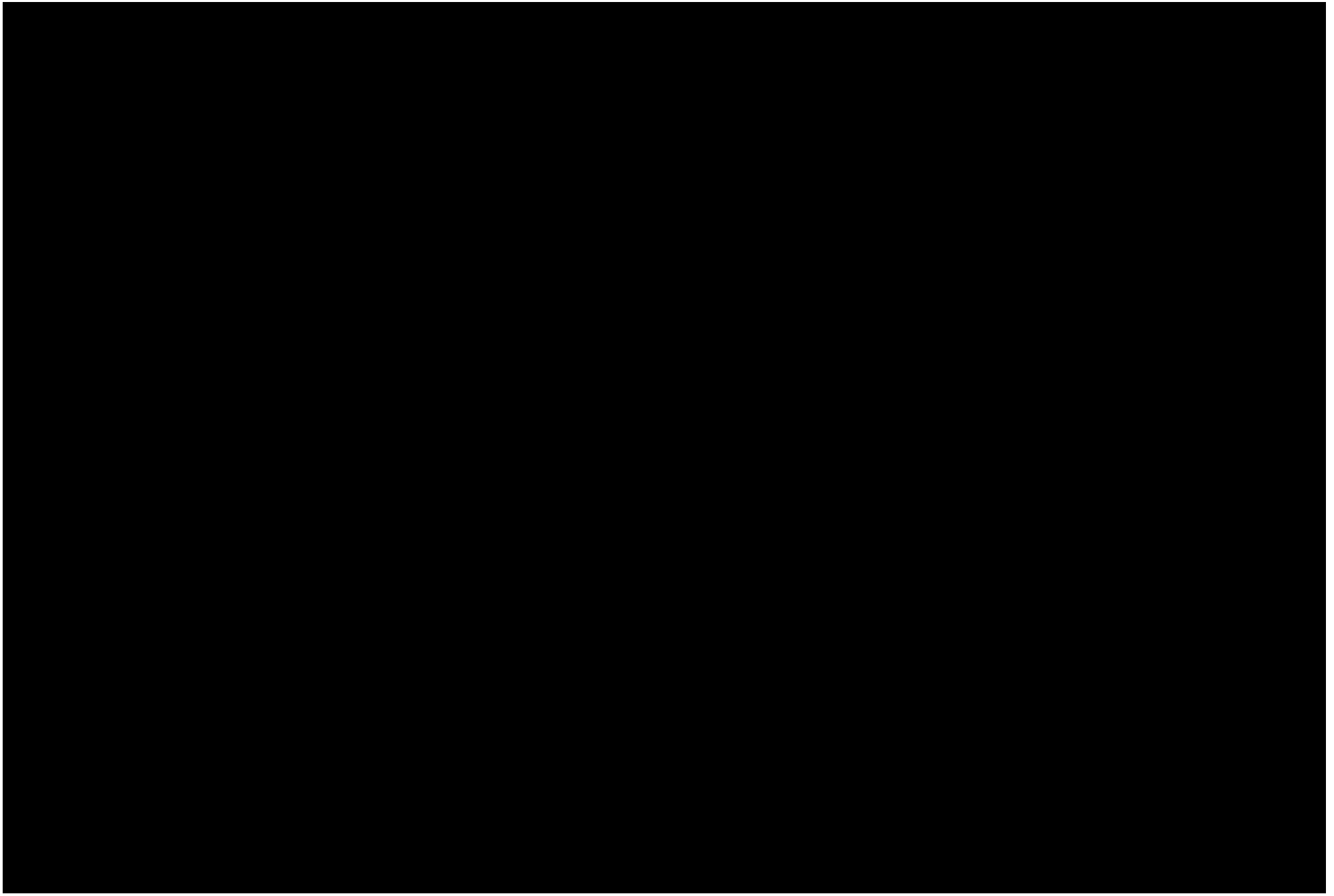


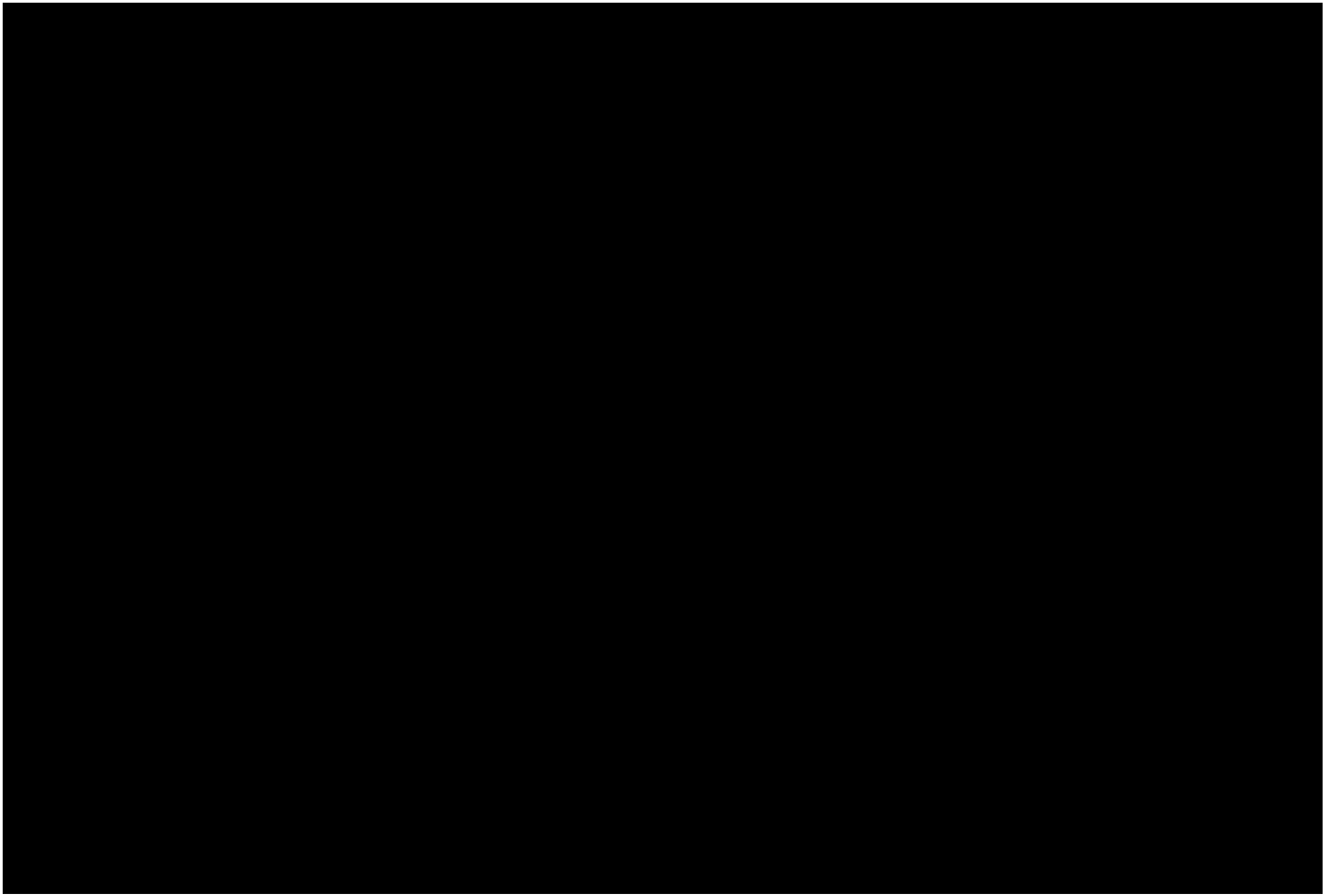


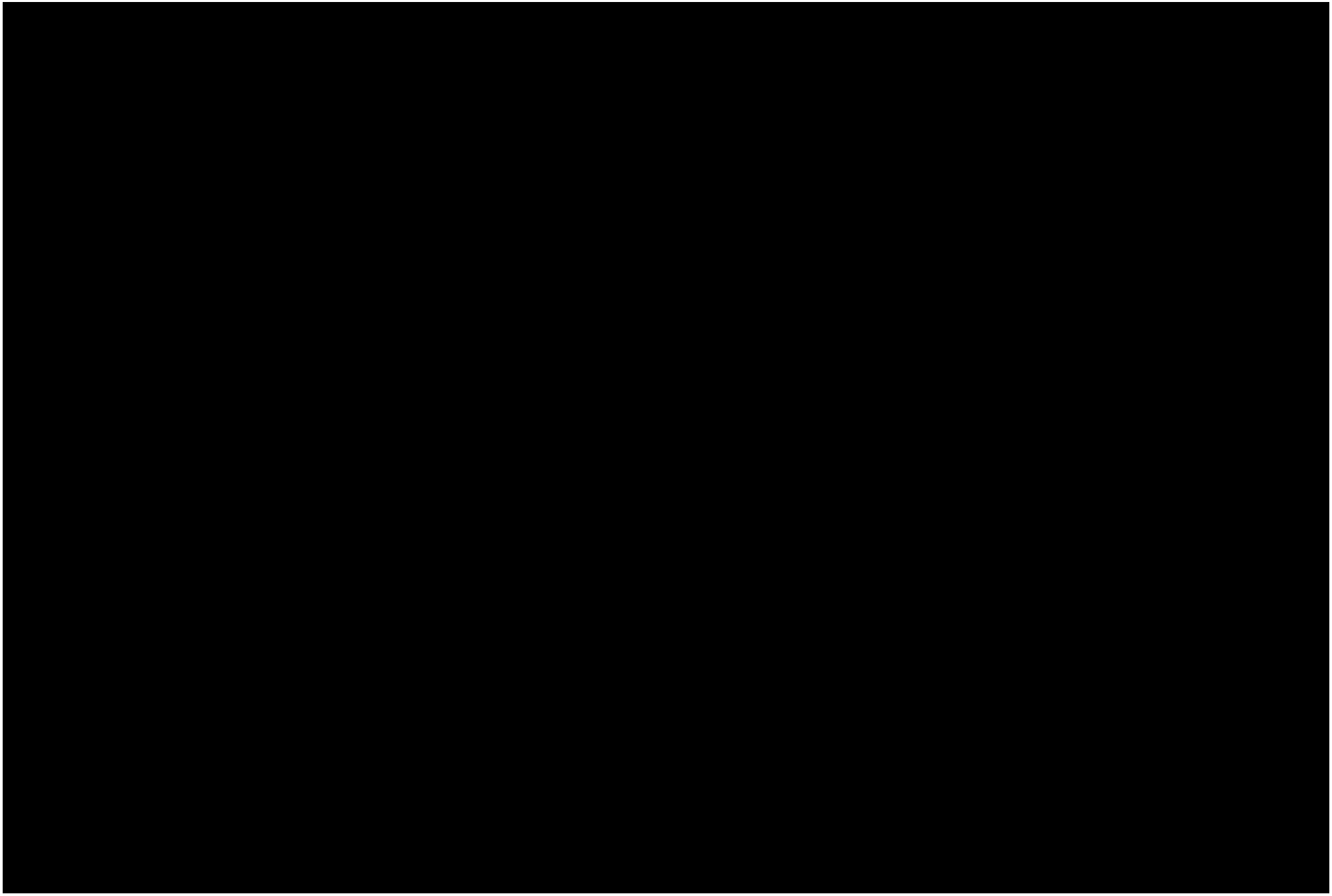


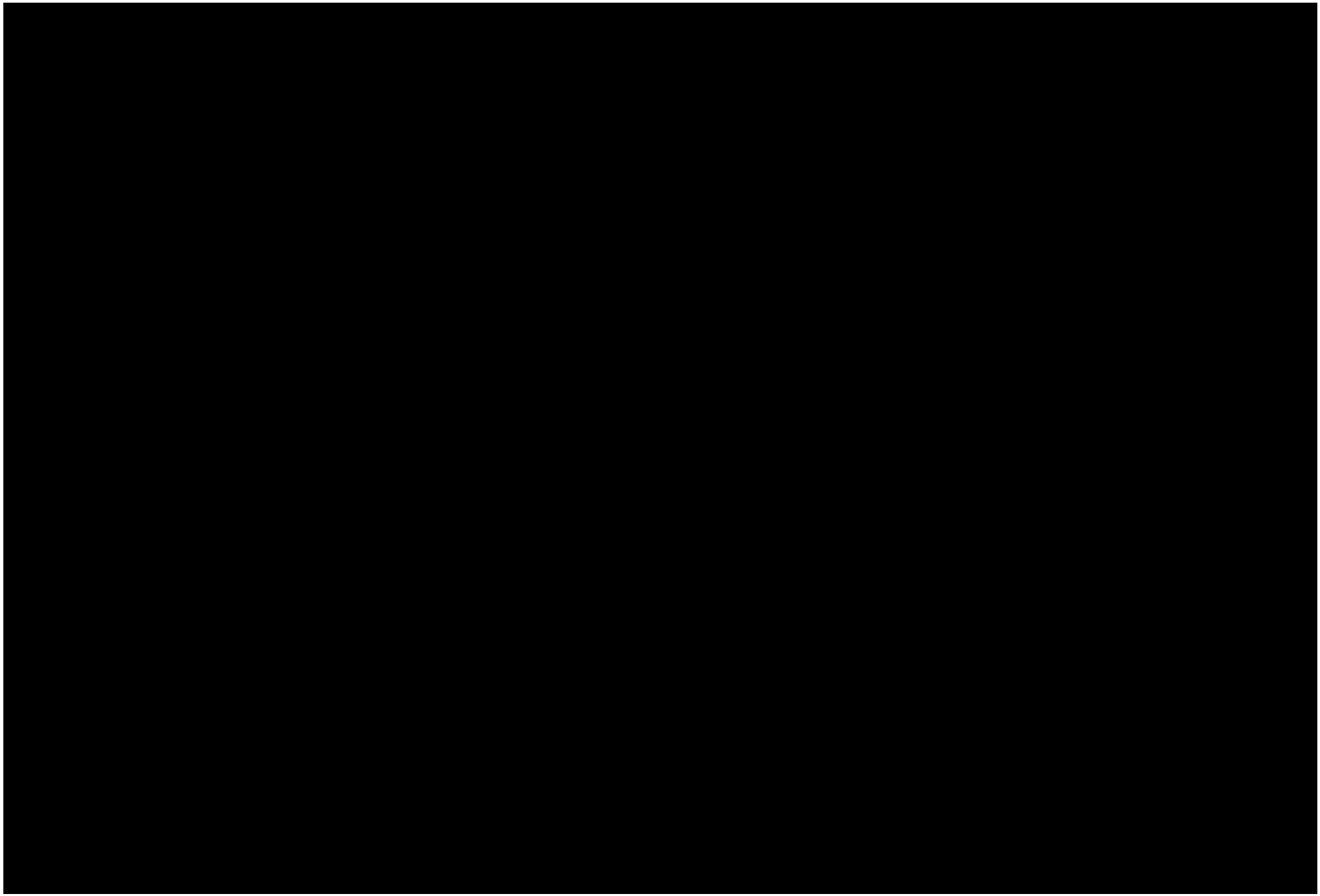


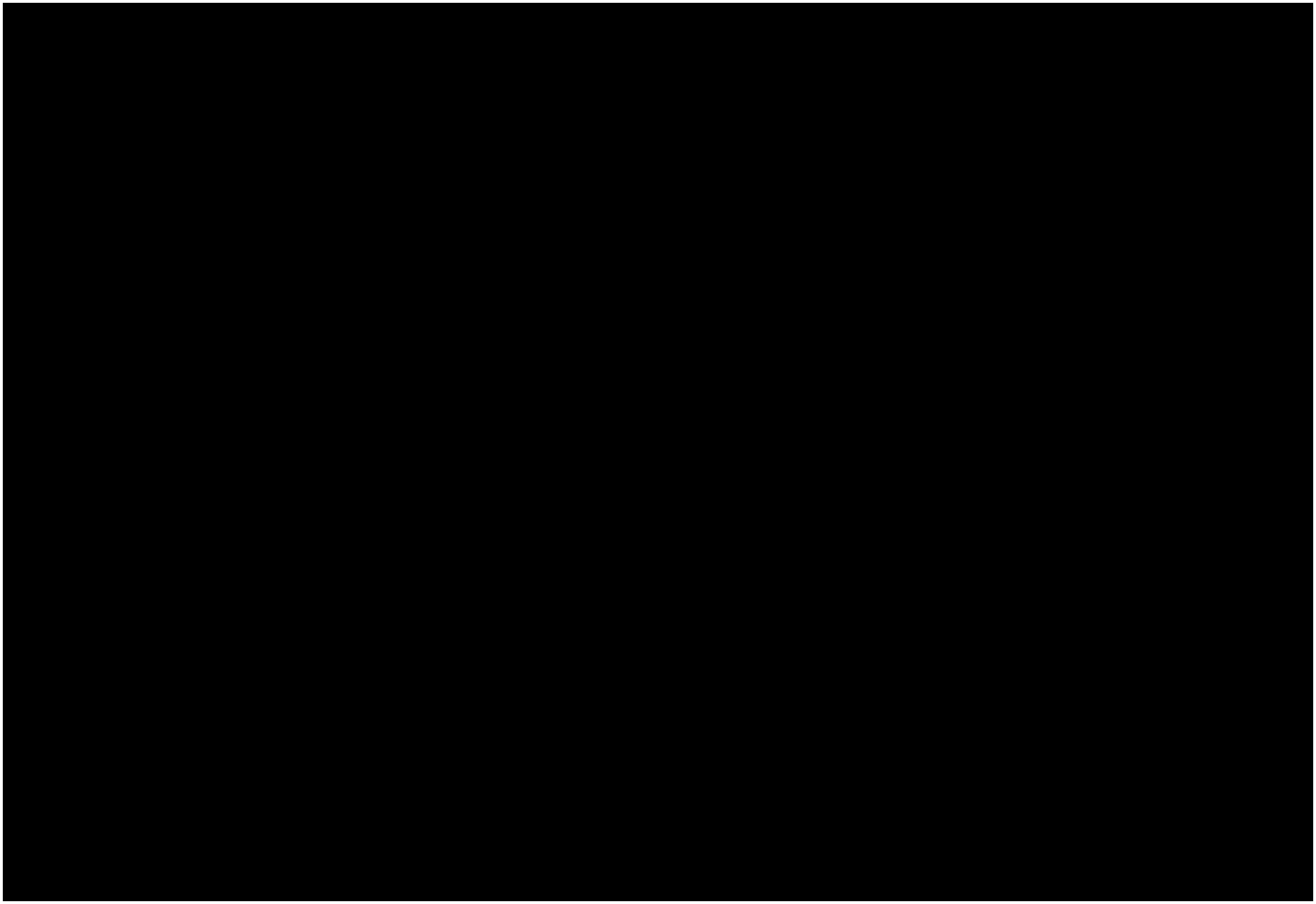


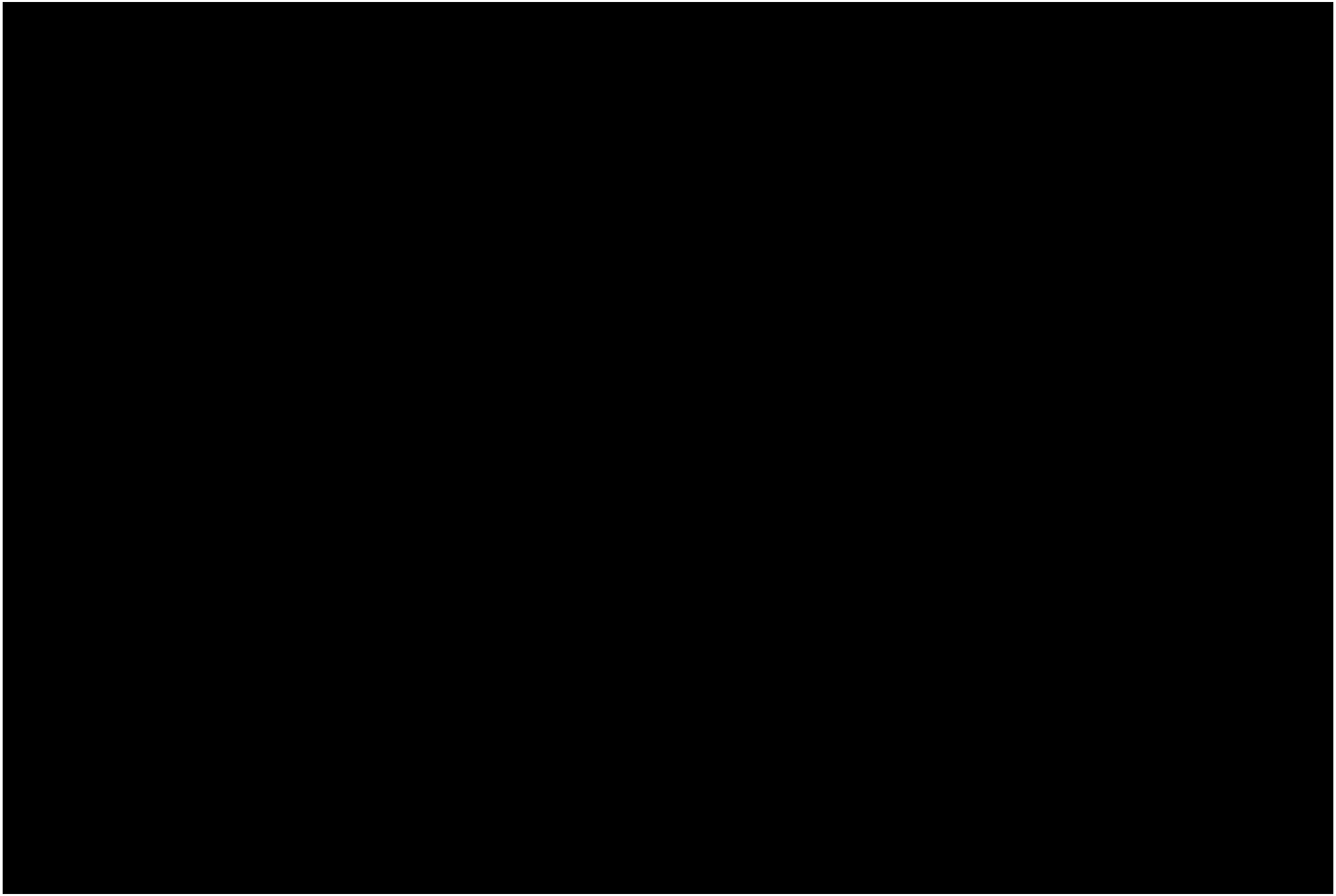


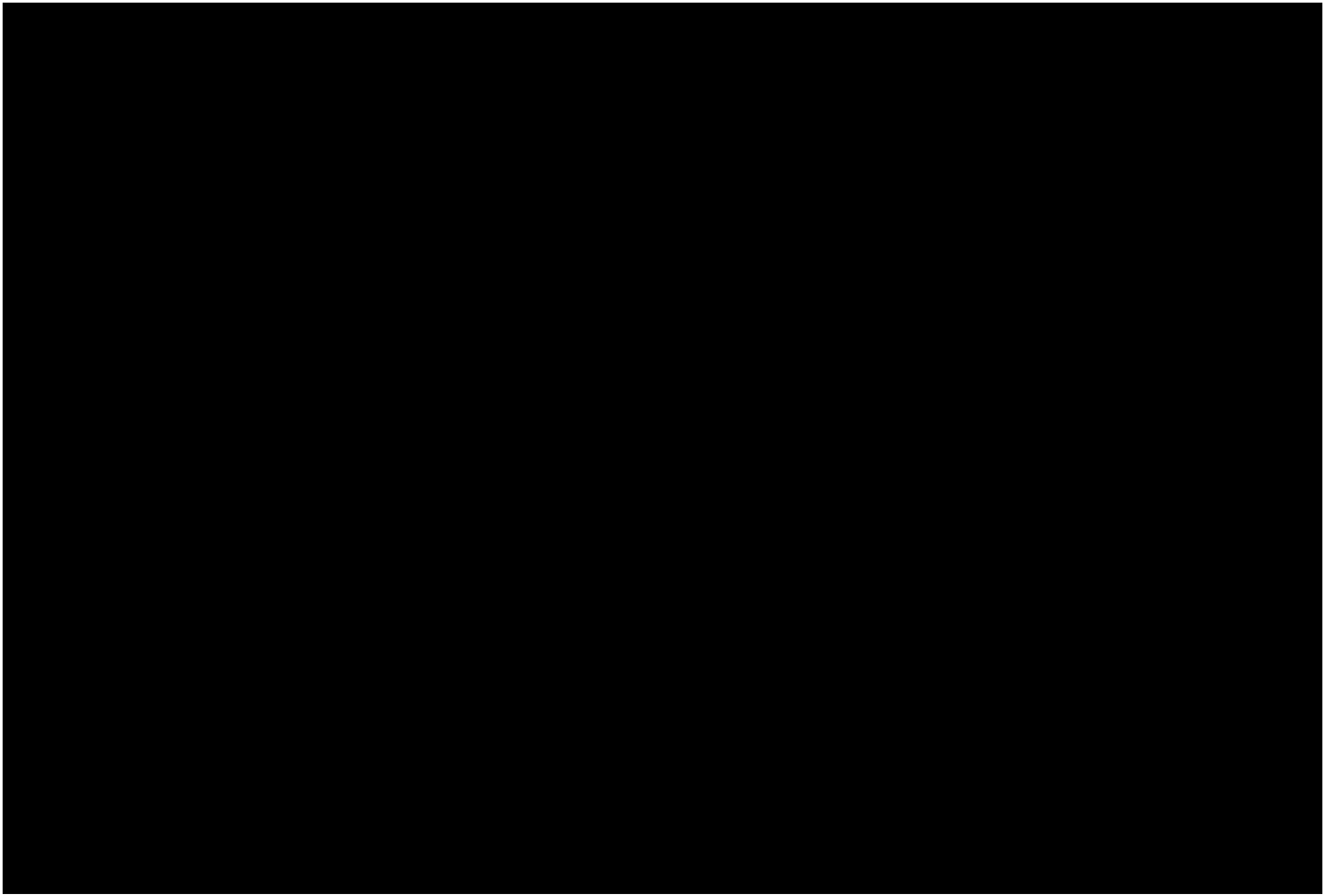












FLOOD REPORT - NO.6

Egadr Dam and Scotts Peak Dam - Simultaneous Sunny Day Failure
23.0m at the Judbury Flood Gauge and Mean Sea Level
Peak discharge at Judbury: 25,640m^3/s
HUON RIVER from JUDBURY to WATERLOO (Huon Estuary), including TAHUNE

Maximum Flood Levels at Bridges	(m gauge)	(m AHD)
Tahune Bridge	27.0	71.8
Weld Rd Bridge	Not estimated	
Judbury Bridge	23.0	33.9
Huonville Bridge	16.4	15.0

Notes
~ The flood levels have been estimated using MIKE Flood software and are relative to the Australian Height Datum (m AHD).
~ Upstream of Judbury the MIKE Flood model is one-deimensional based on 1:25,000 topographic map contours.
~ Downstream of Judbury the MIKE Flood model is 2D with the floodplain based on LiDAR from Geoscience Australia and the river channel based on a variety of survey sources.

~ Coordinates are MGA (Map Grid of Australia), Zone 55.
~ For zones, refer to Appendix C of the FEP.

~ Emergency services should check maps (e.g. Street Atlas) for nearby properties that may be affected.
~ Buildings with floor levels greater than 1.0m above the predicted flood level are not included in this table.

Summary of flooded infrastructure

Bridges

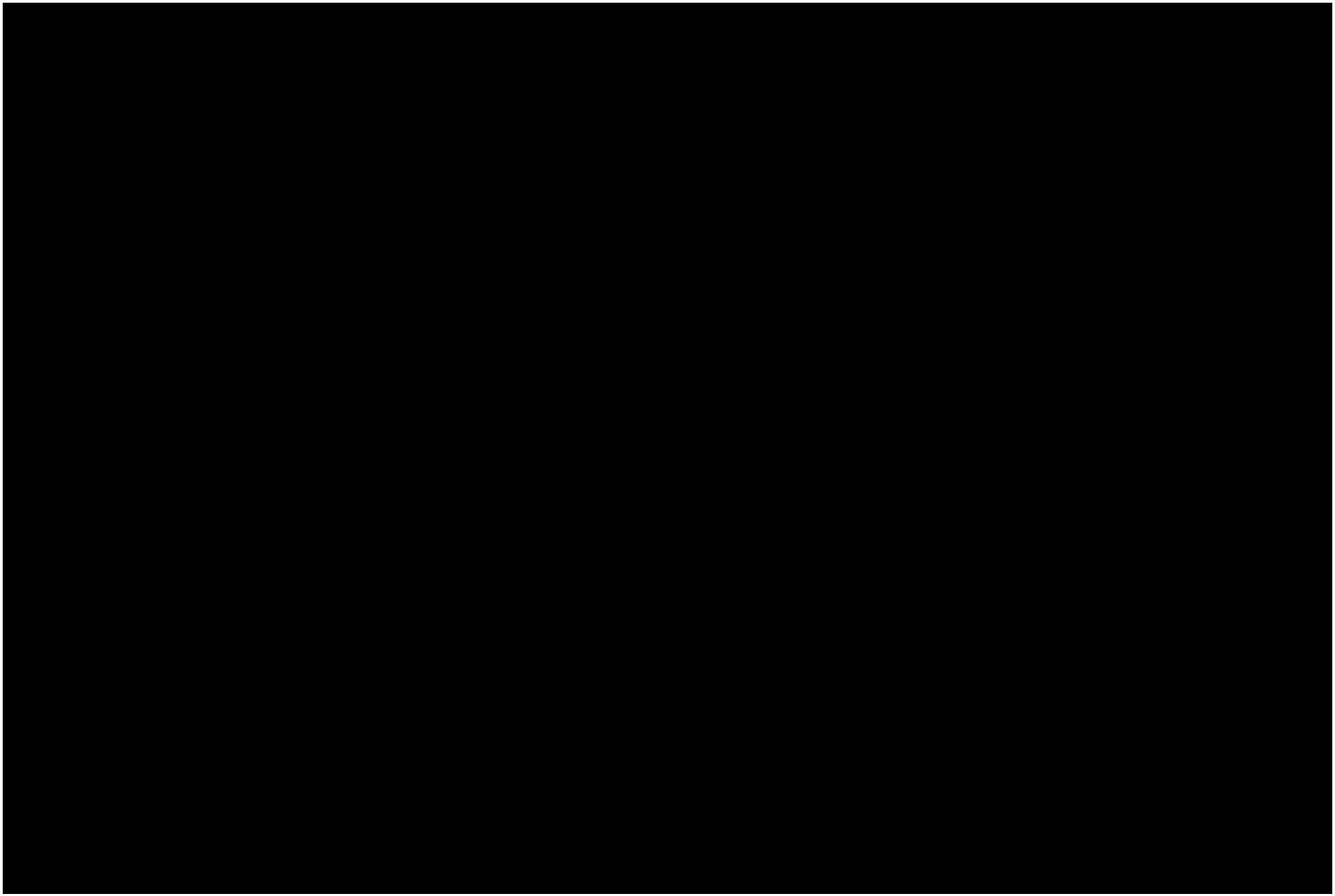
	Roads	Easting	Northing	Estimated depth (m)	Comment
1	Channel Highway	504420	5235080	Greater than 1m	Significant length of Highway inundated between Huonville and Cradoc Hill Road
2	Wilmot Road near Mountain Creek bridge	503411	5237036	Greater than 1m	Inundated for full length.
3	Glen Huon Road, approx 1km from Huon Bridge	503012	5236139	Greater than 1m	Inundated at numerous locations along its length.
4	Huon Highway	502008	5236183	Greater than 1m	Significant length of Highway inundated between Huonville and Port Huon.
5	Huonville	503870	5235590	Greater than 1m	All roads and streets in Huonville town centre inundated.

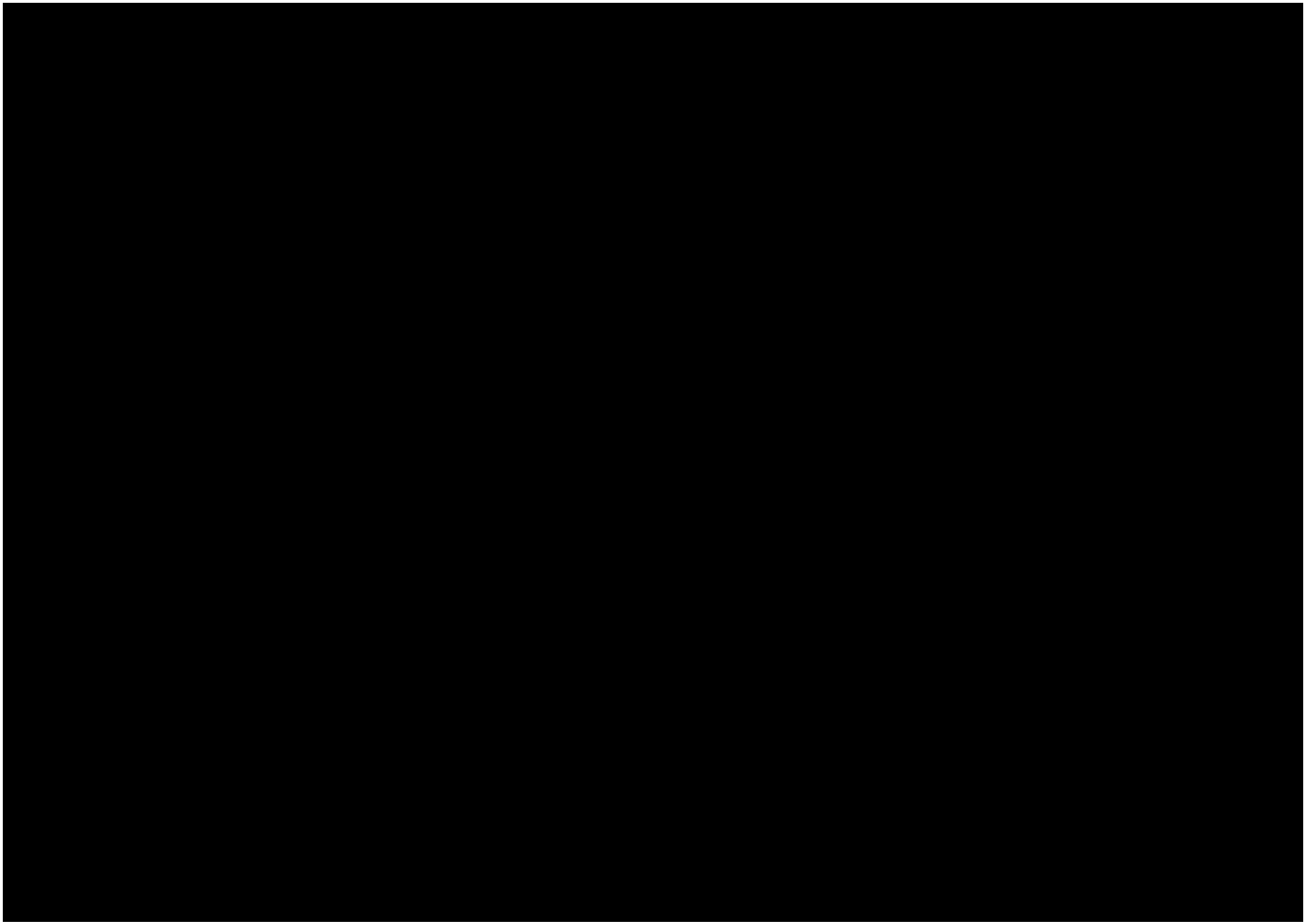
	Bridges	Easting	Northing	Estimated depth (m)	Comment
1	Tahune Bridge	477907	5228581	20.9	Bridge overtopped - likely to be washed away.
2	Weld Rd Bridge	485244	5232805		Bridge overtopped - likely to be washed away.
3	Judbury Bridge	494165	5239266	12.2	Bridge overtopped - likely to be washed away.
4	Huonville Bridge	503785	5235423	10.9	Bridge overtopped - likely to be washed away.

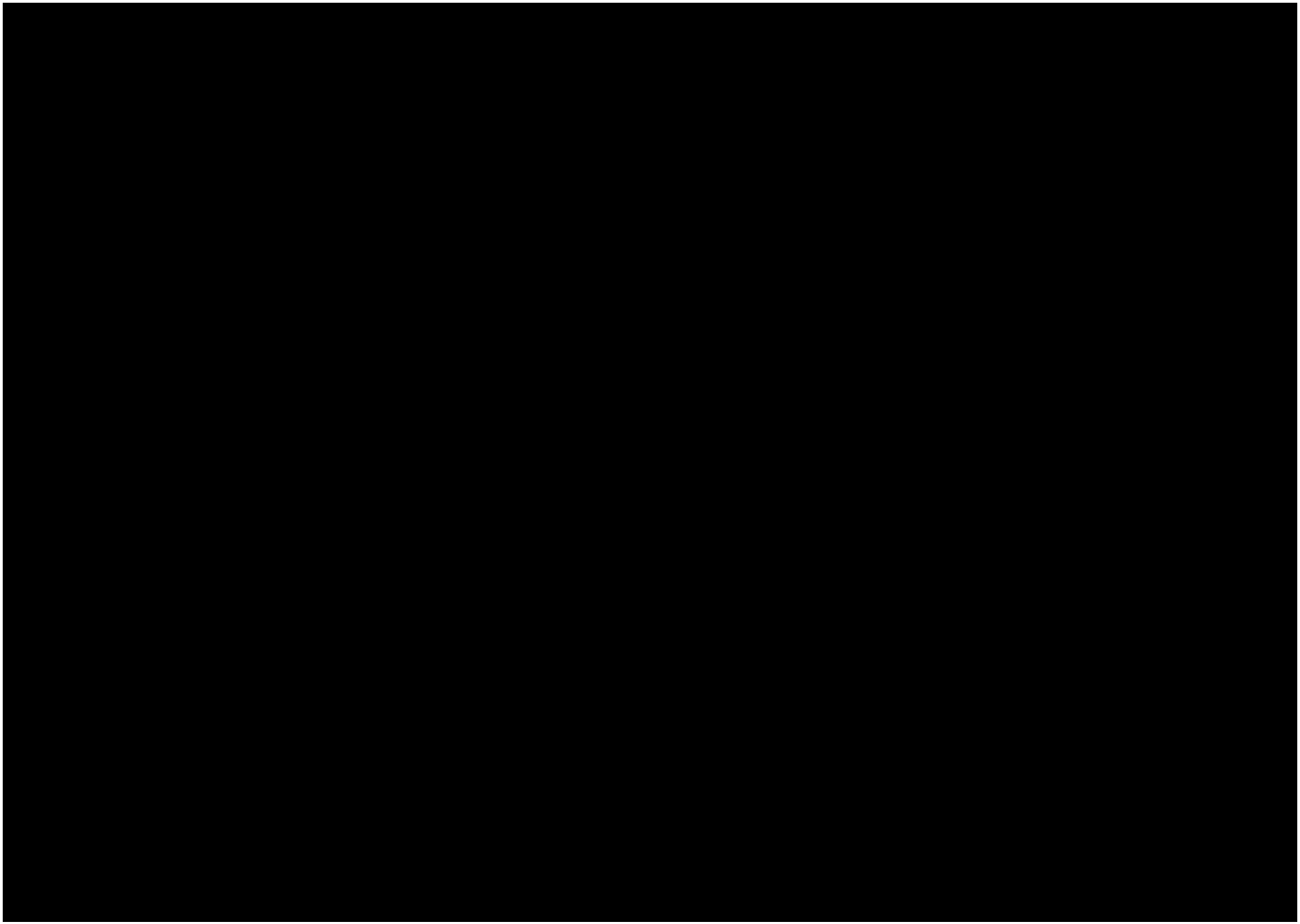
1. Tahune bridge deck level: [redacted] m AHD approx
2. Weld Road bridge deck level: 39.7 m AHD from SPM10617
3. Judbury bridge deck level: 21.71 m AHD from SPM9697 (southern side of bridge). SPM = State Permanent Mark (survey mark).
4. Huonville Bridge deck level: 4.12 m AHD, HTC Survet Station 680 (northern side of bridge at intersection with Channel Highway).

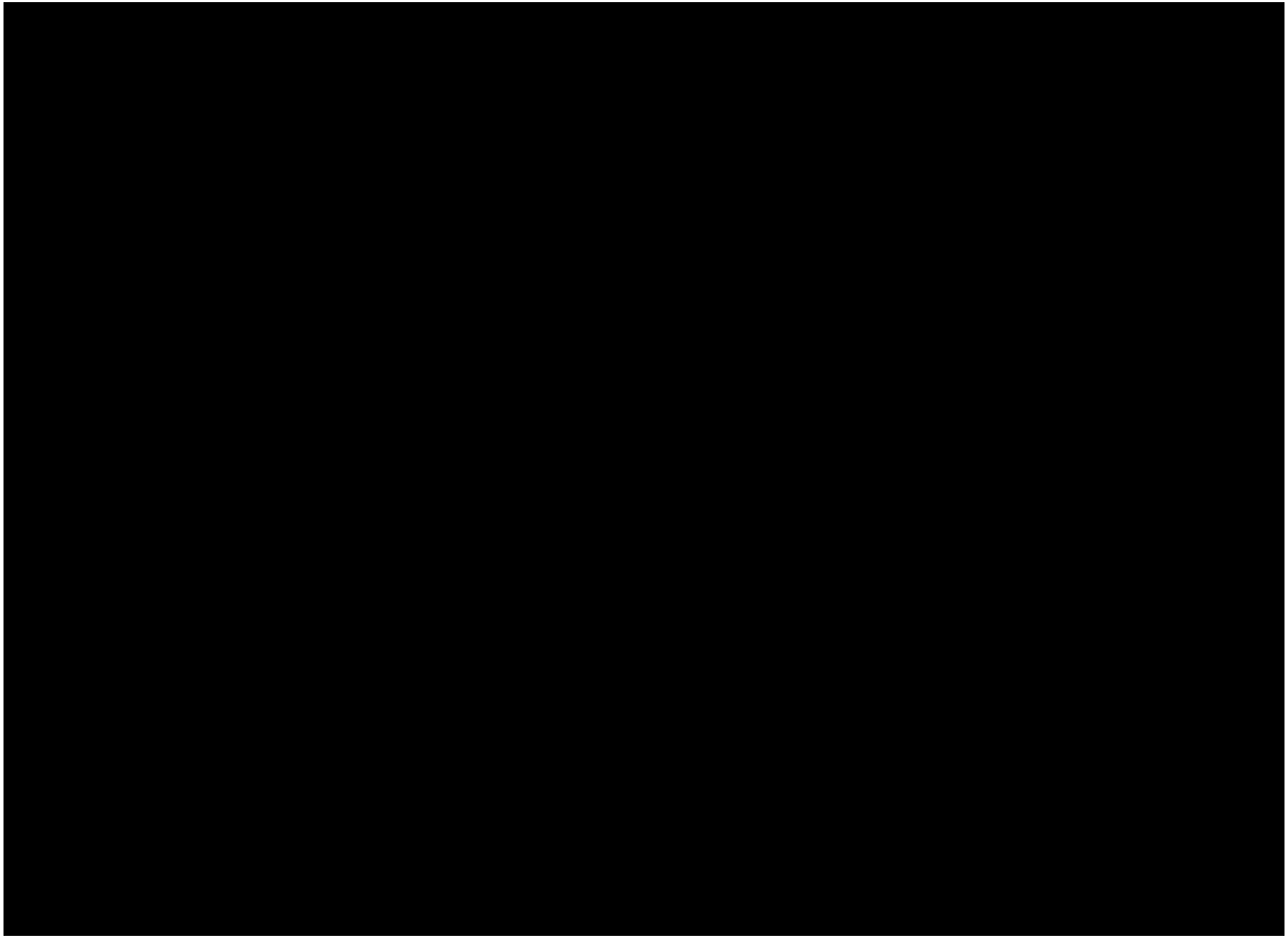
Summary of number of properties threatened

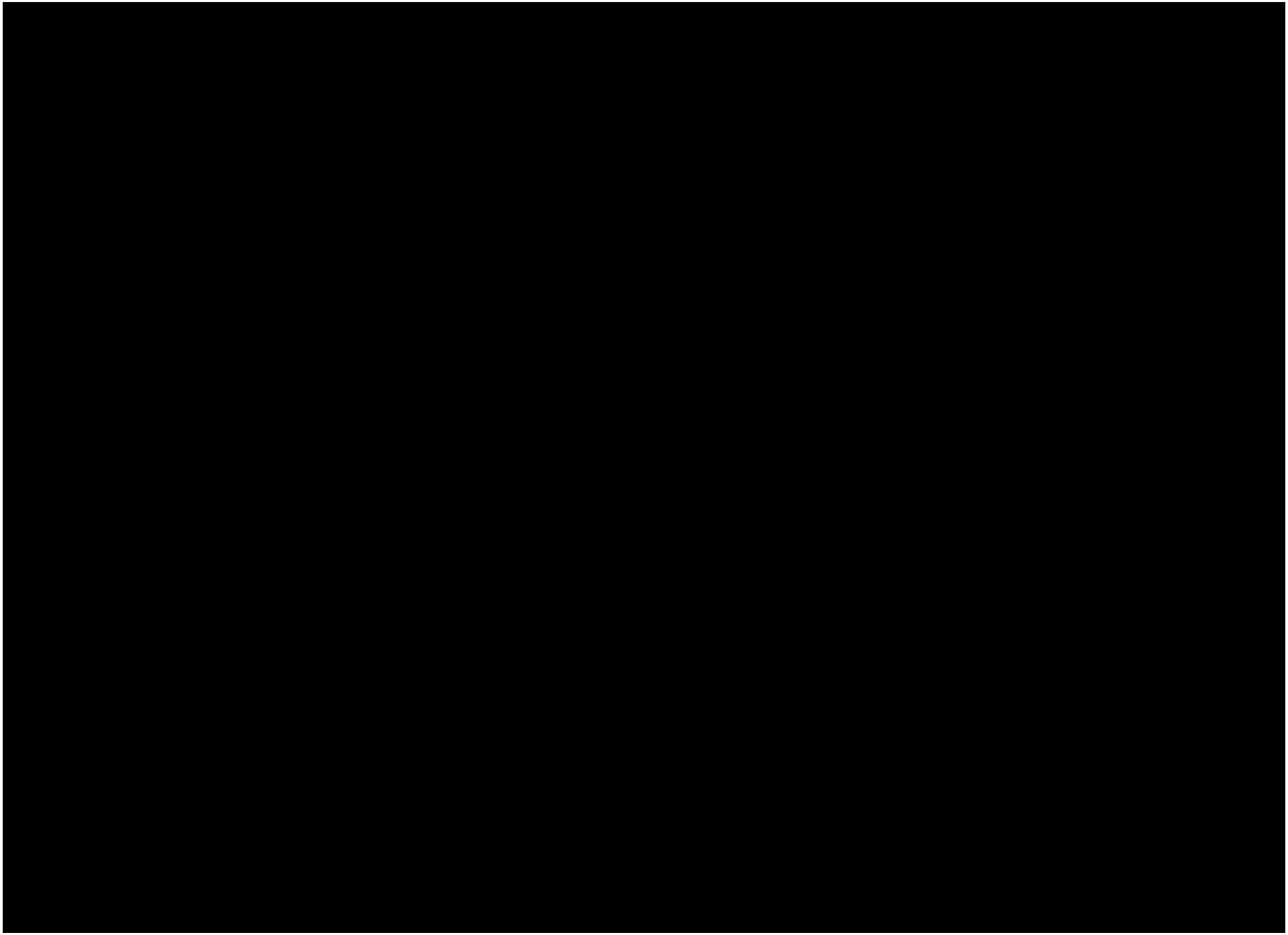
Zone	Area Name	No.
A	Judbury area including Tahune (north of Huon River)	19
B	Judbury-Glen Huon area (south of Huon River)	55
C	Ranelagh	49
D	Wilmot Street, Huonville (past school oval)	68
E	Main Street, Huonville (north of Shield Street)	135
F	Central Huonville	370
G	Flood Road area (eastern Huonville)	86
H	Franklin area, Huon Highway	182
I	Channel Highway	14
J	South of Castle Forbes Bay, Huon Highway	2
K	Cygnet Coast Road (southern section)	3
	Total	983

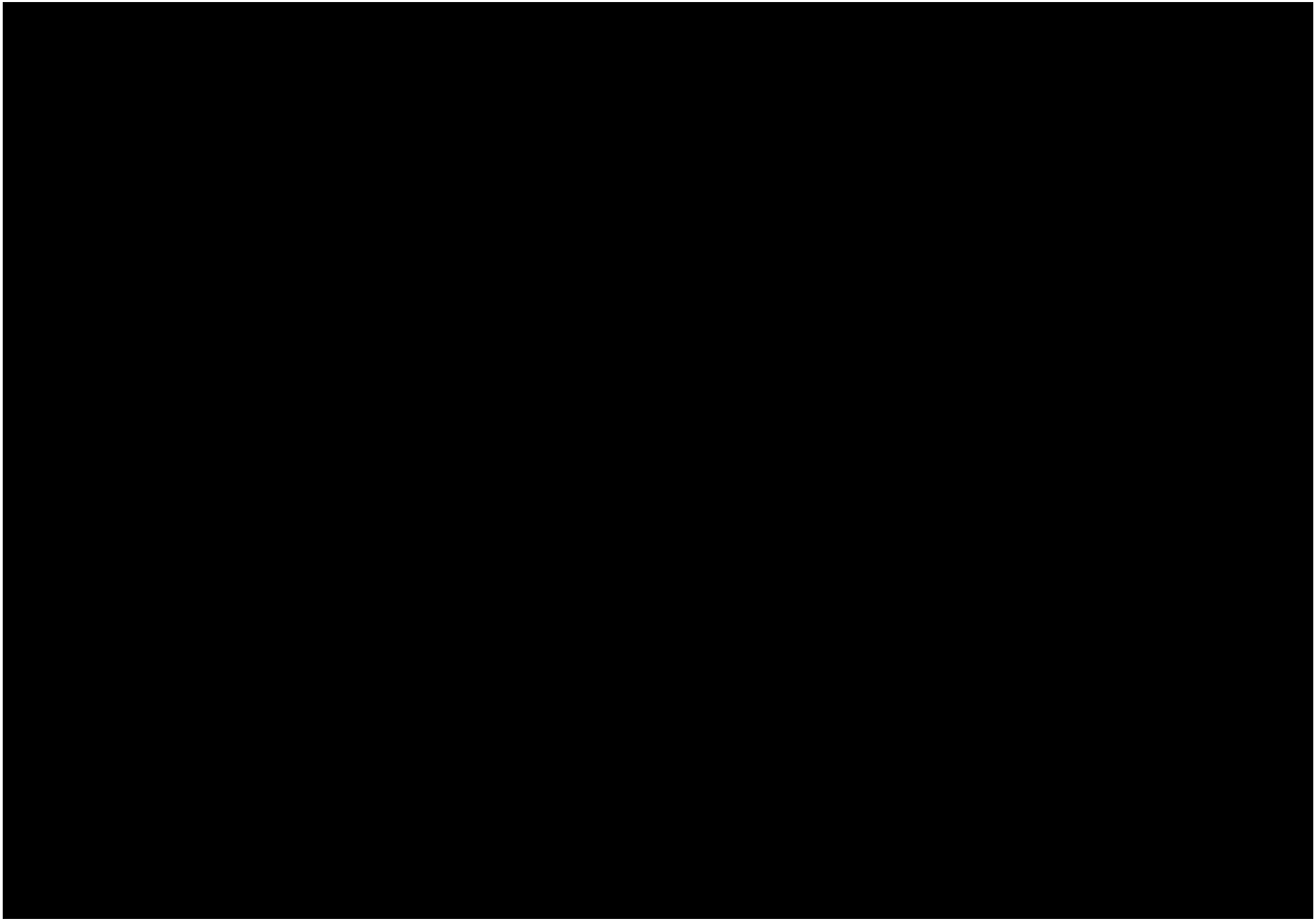


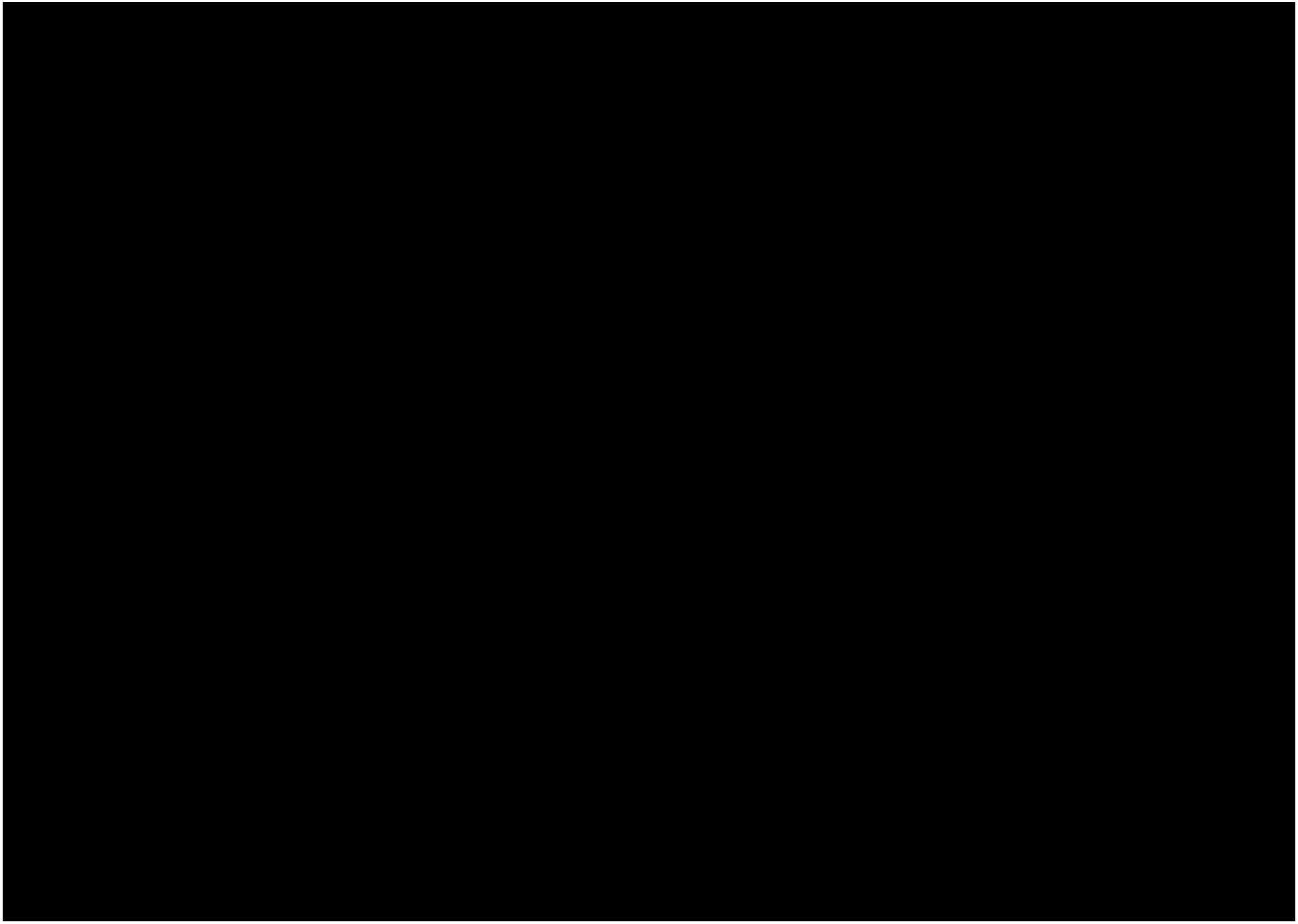


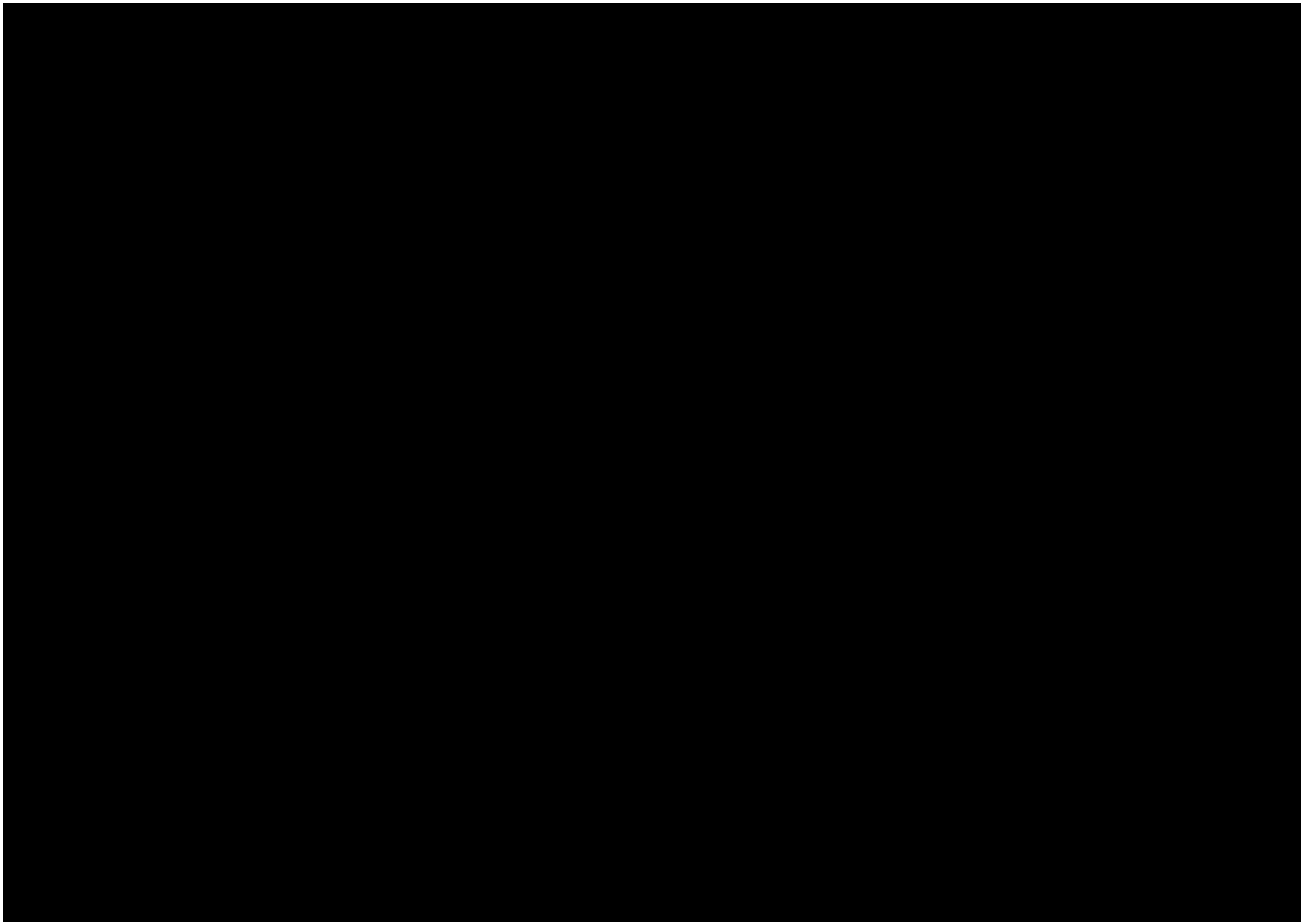


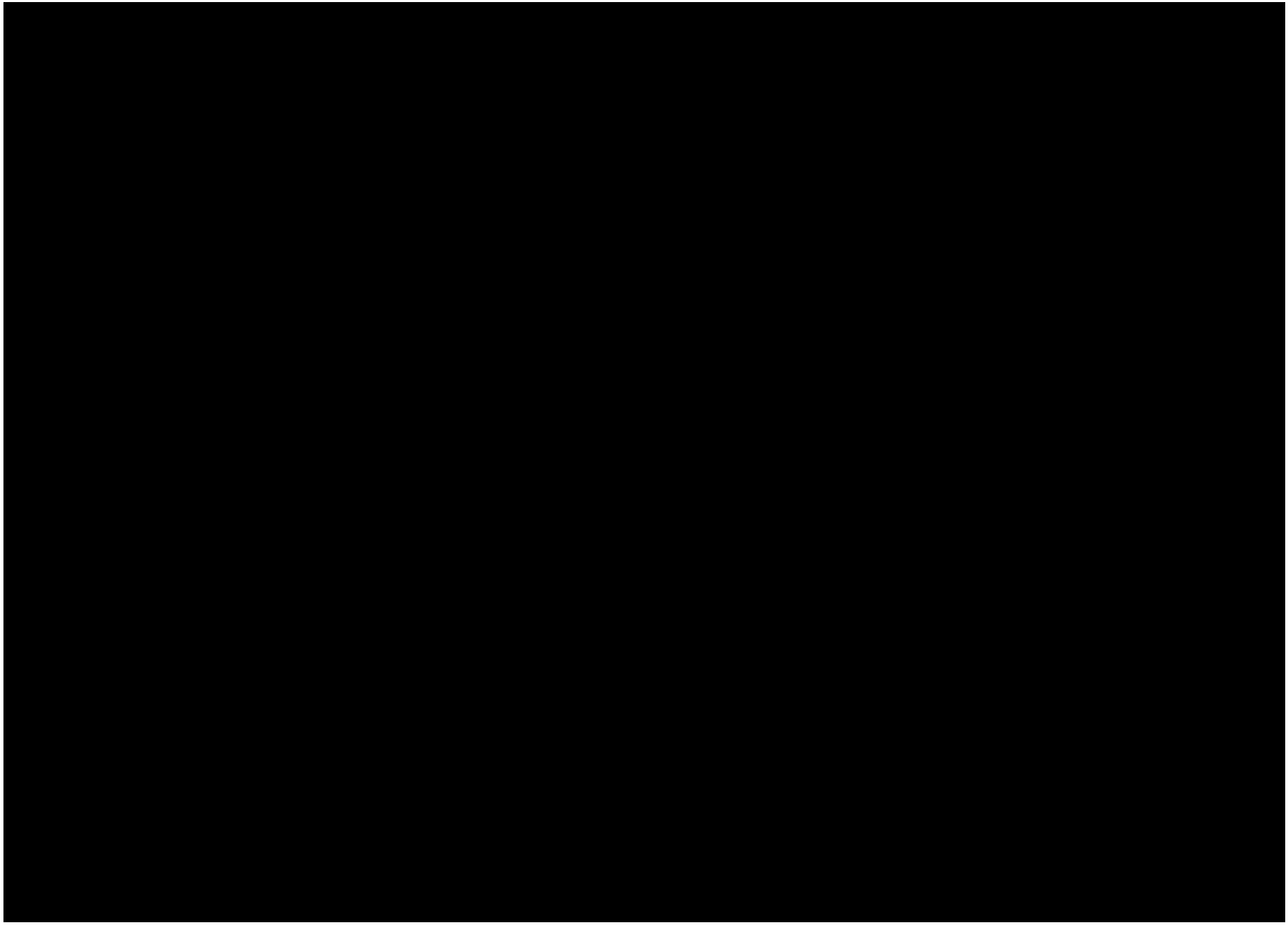


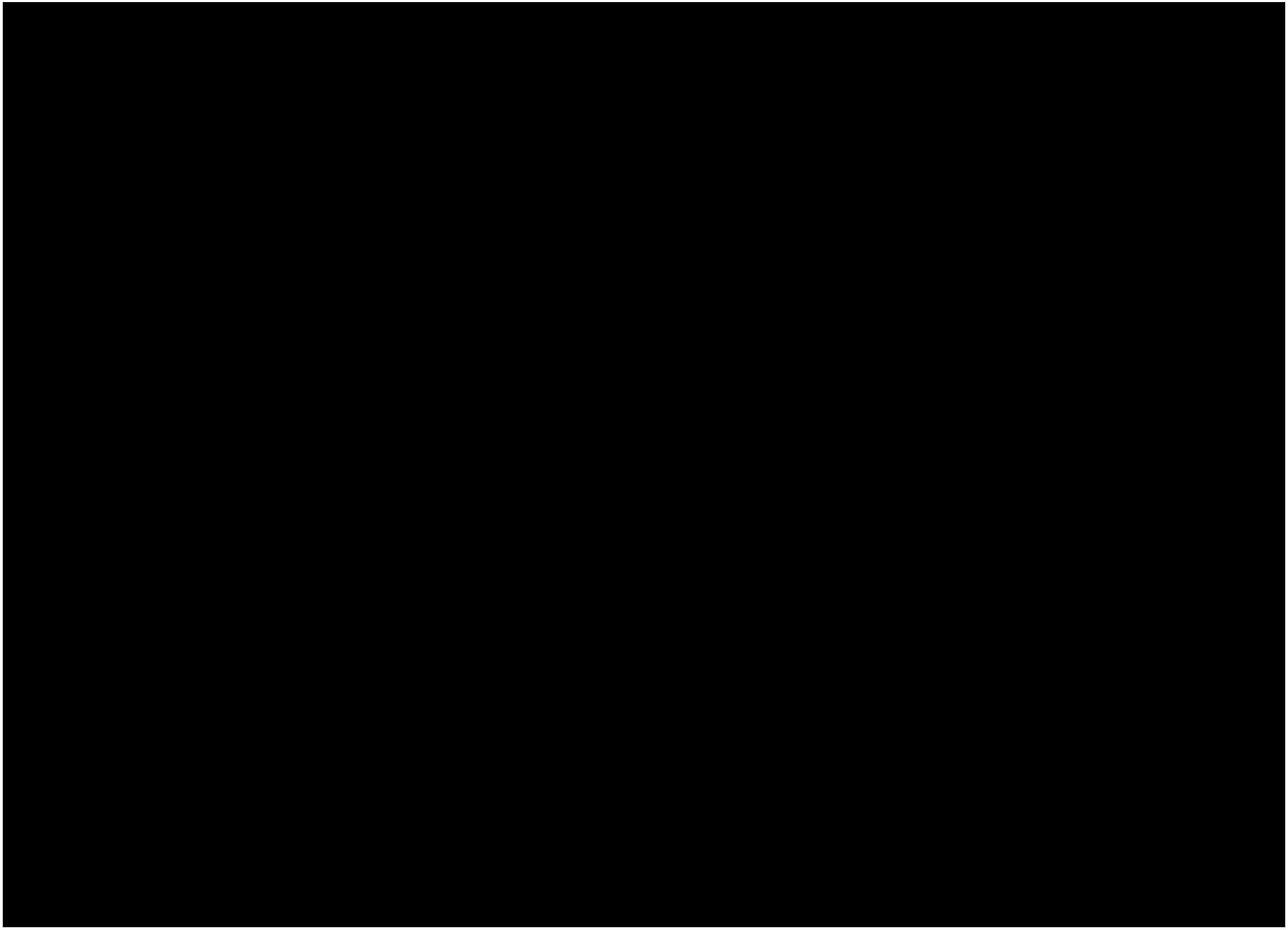


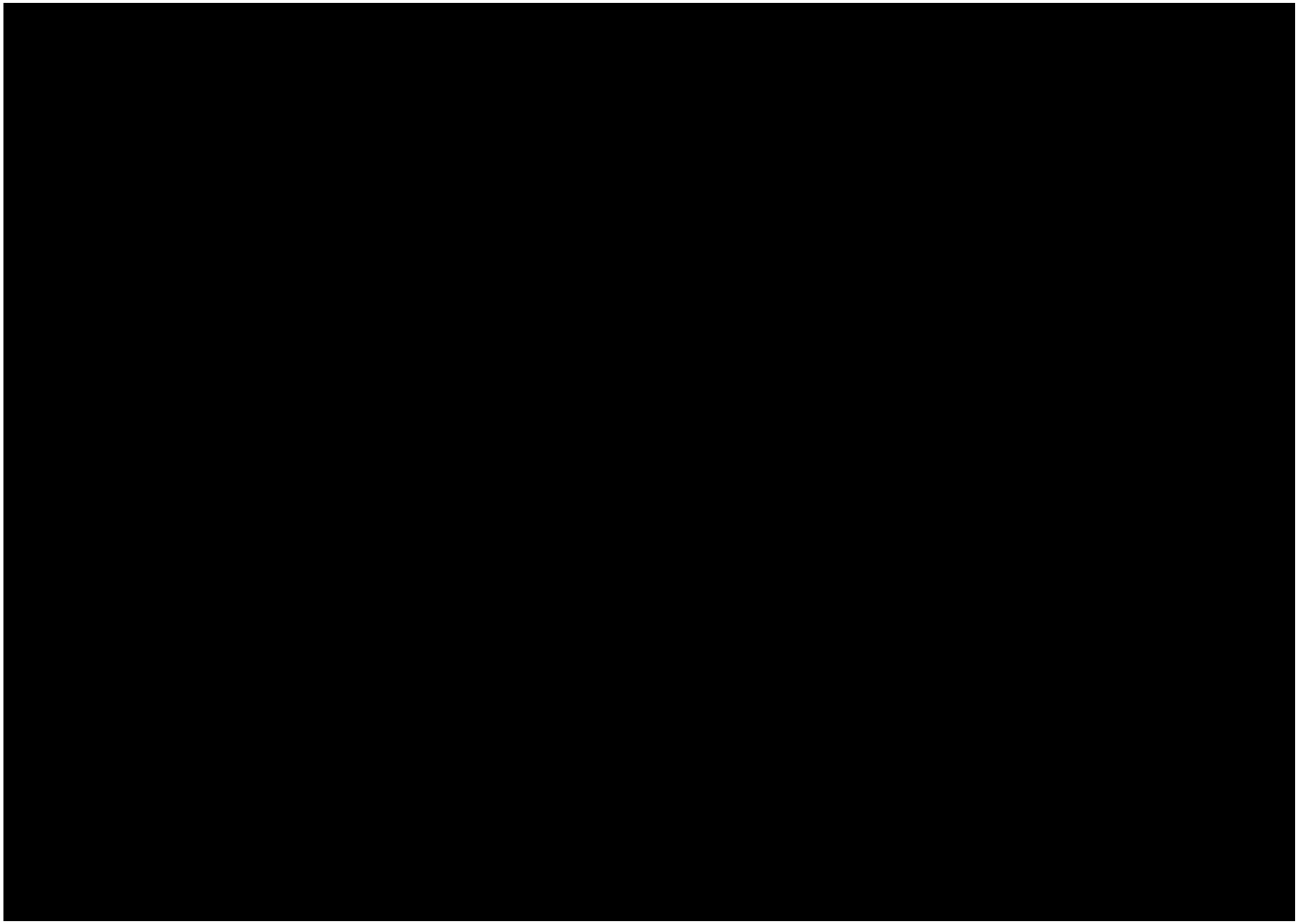


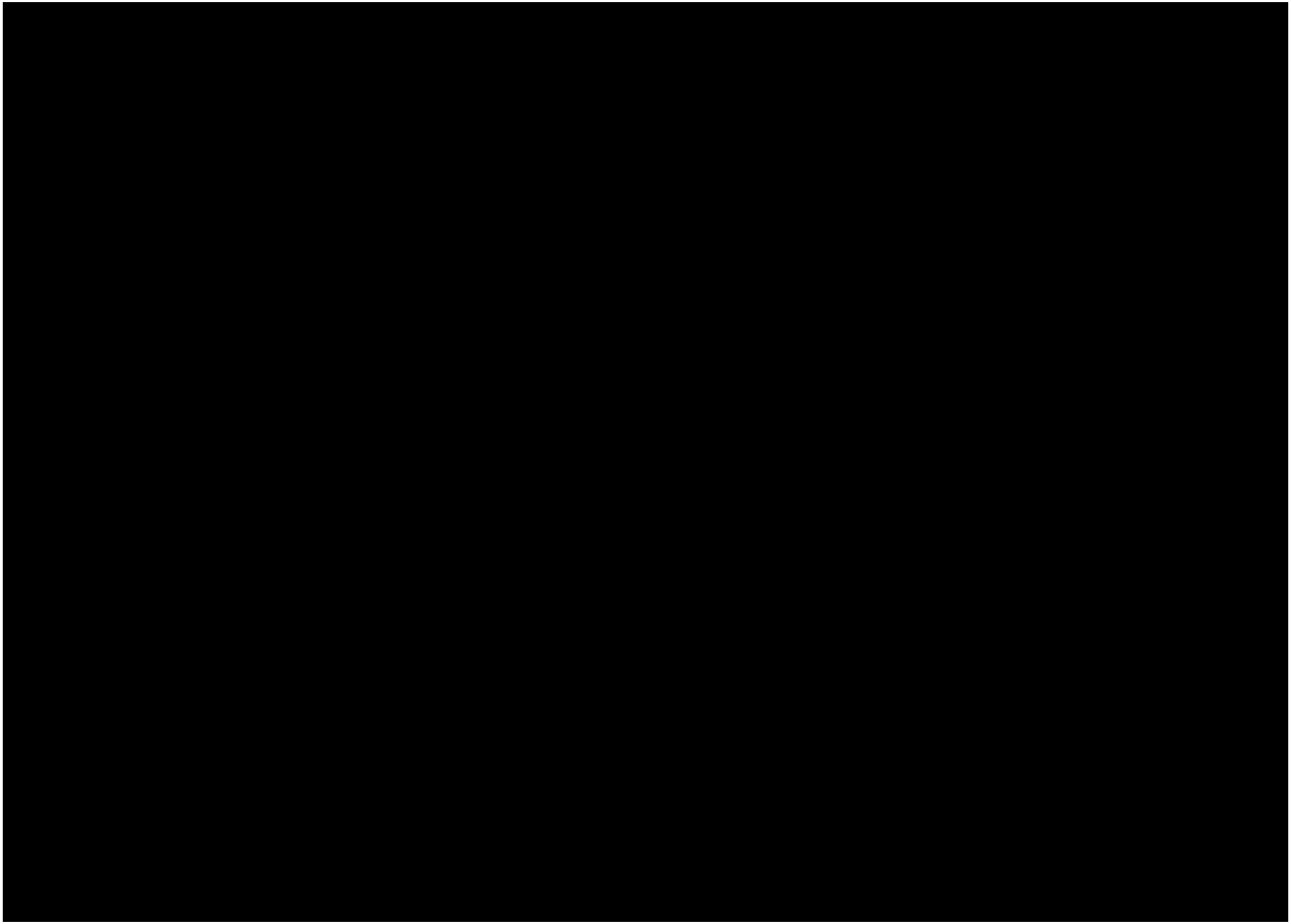


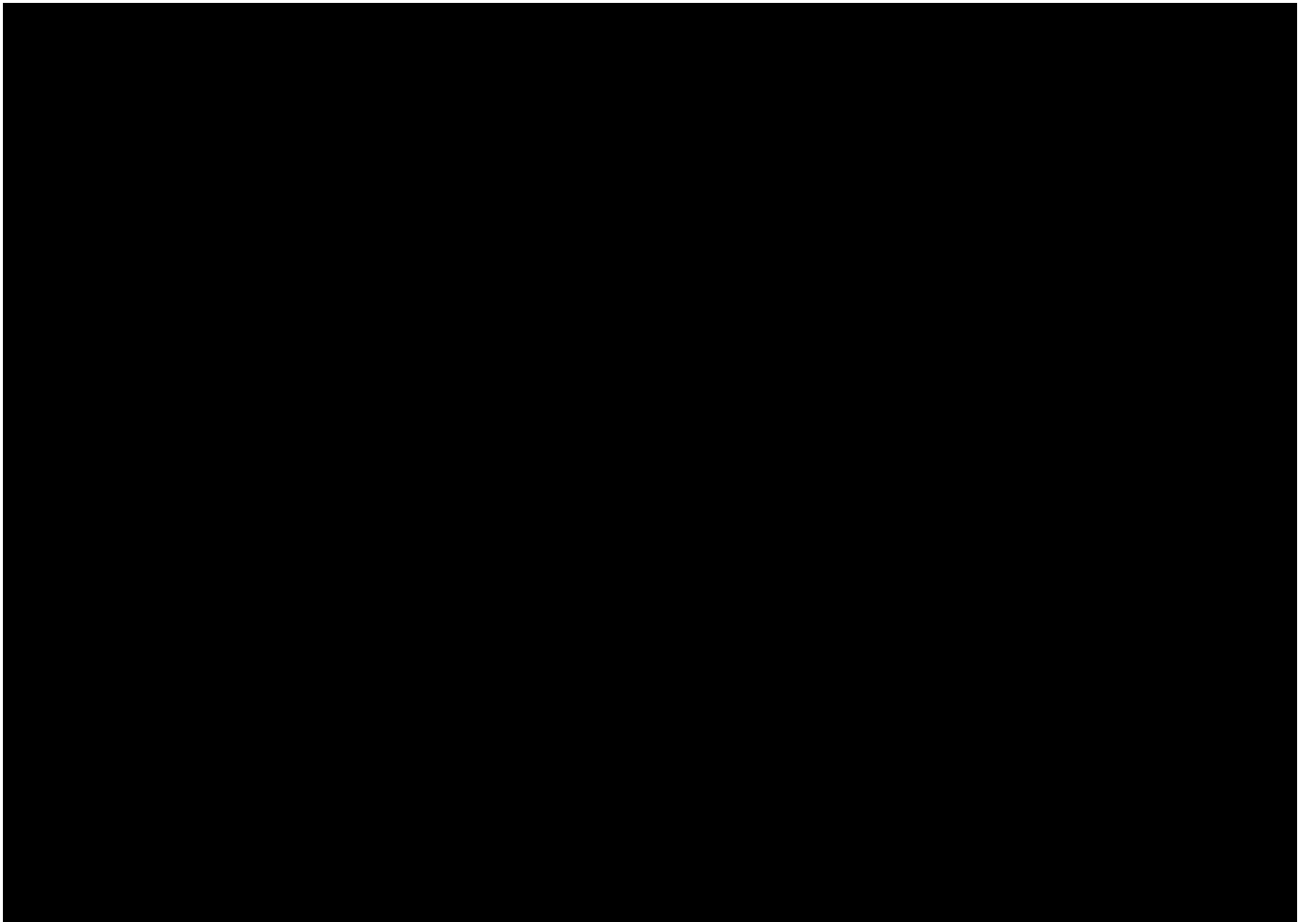


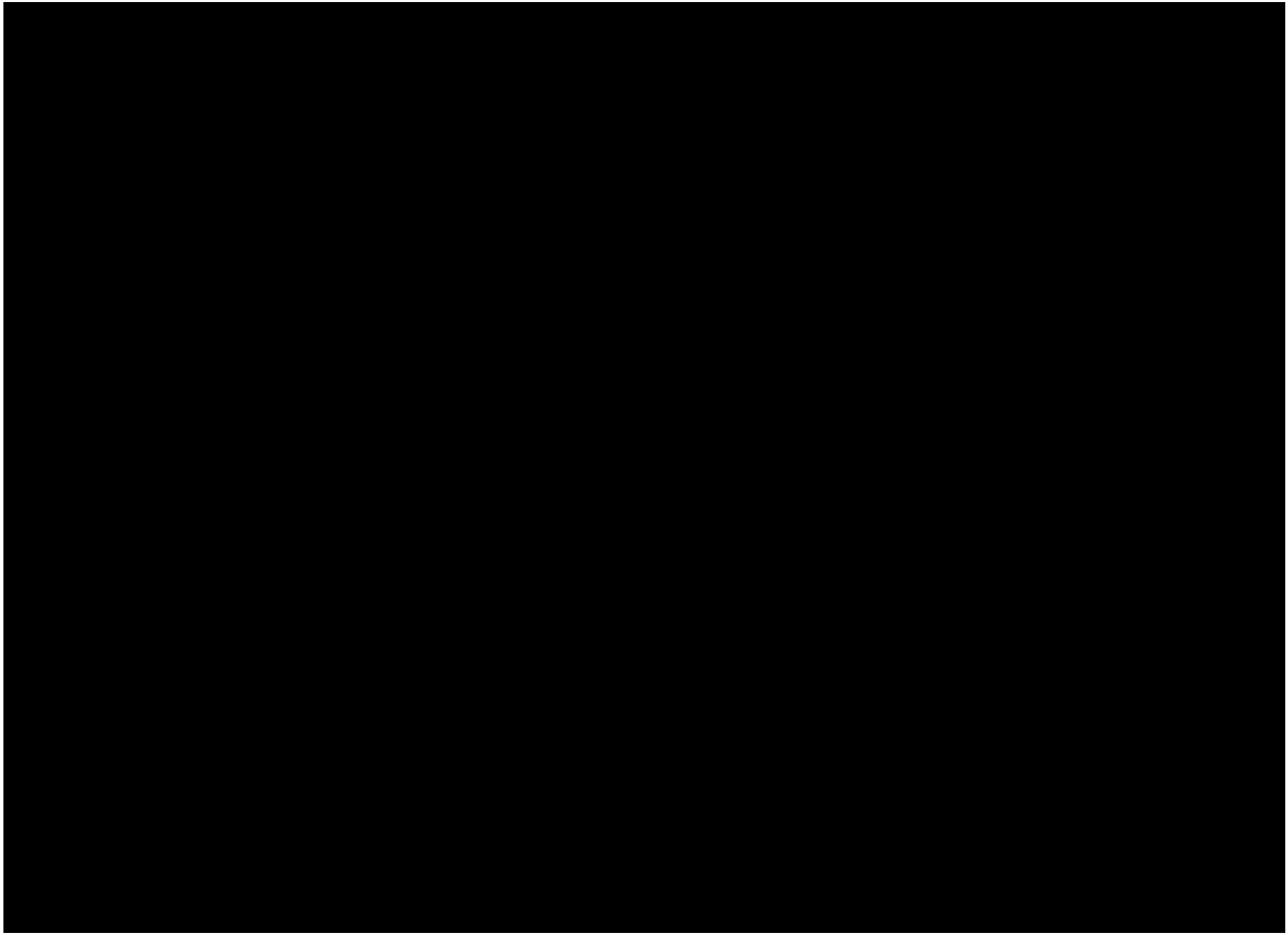


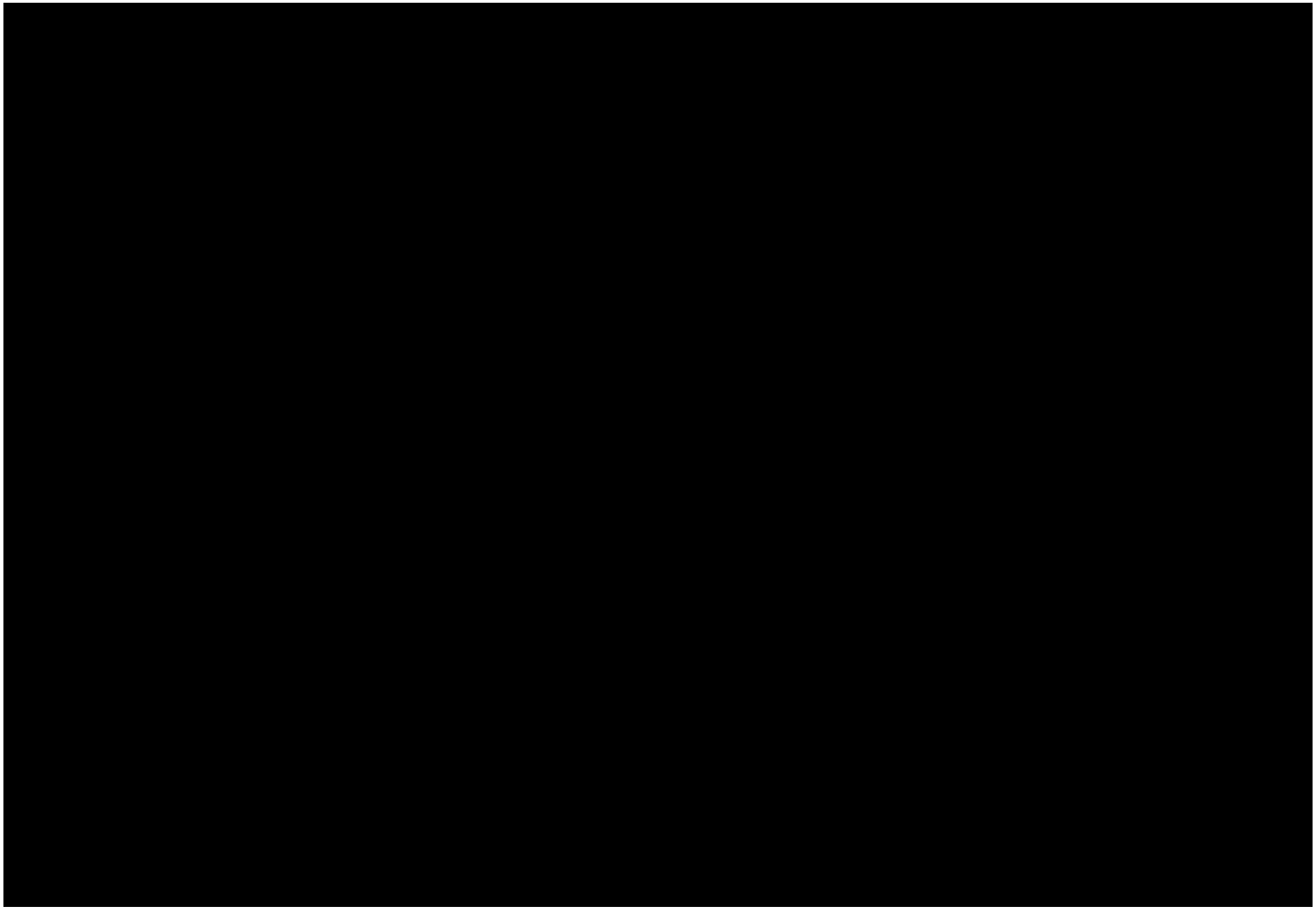


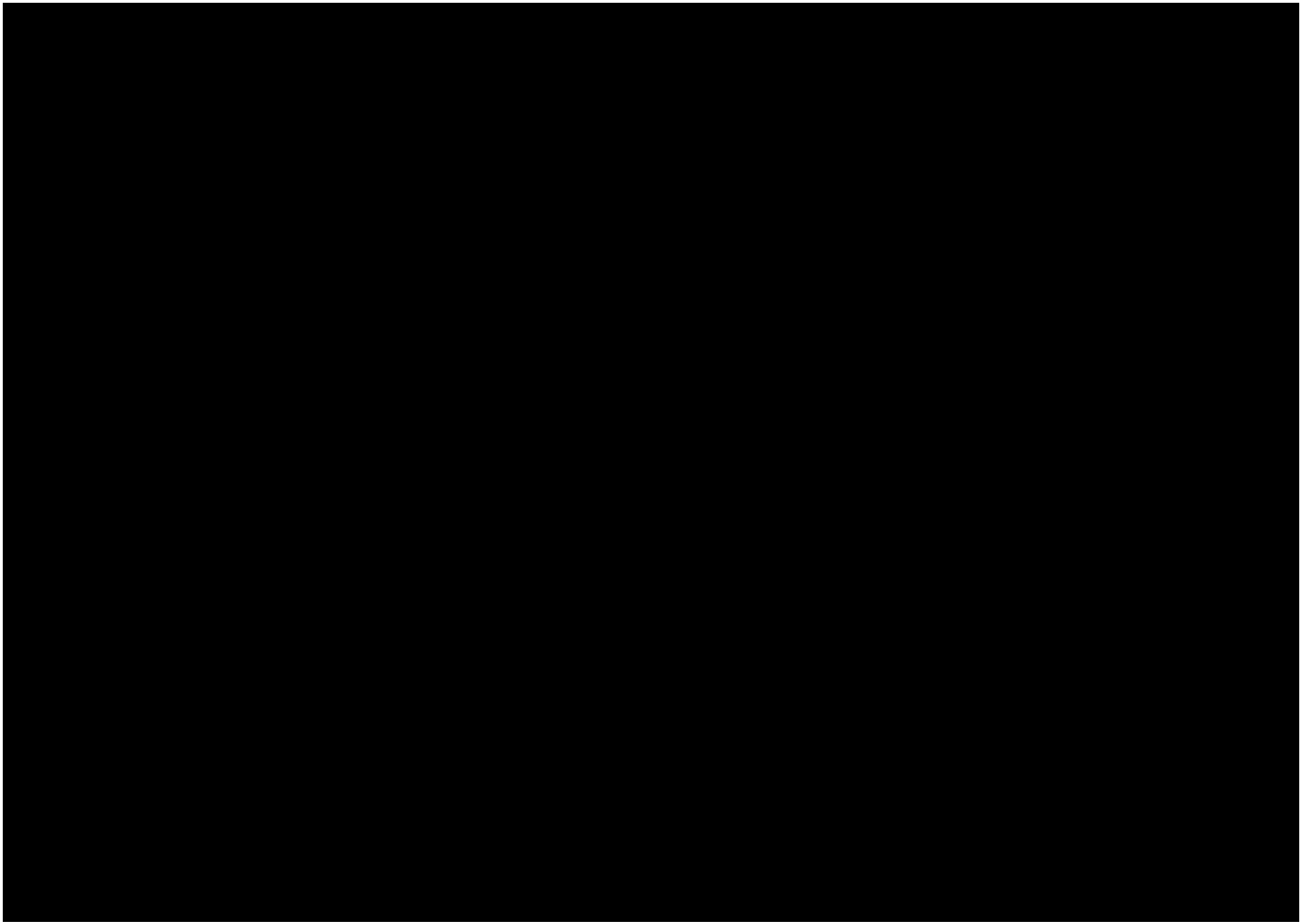


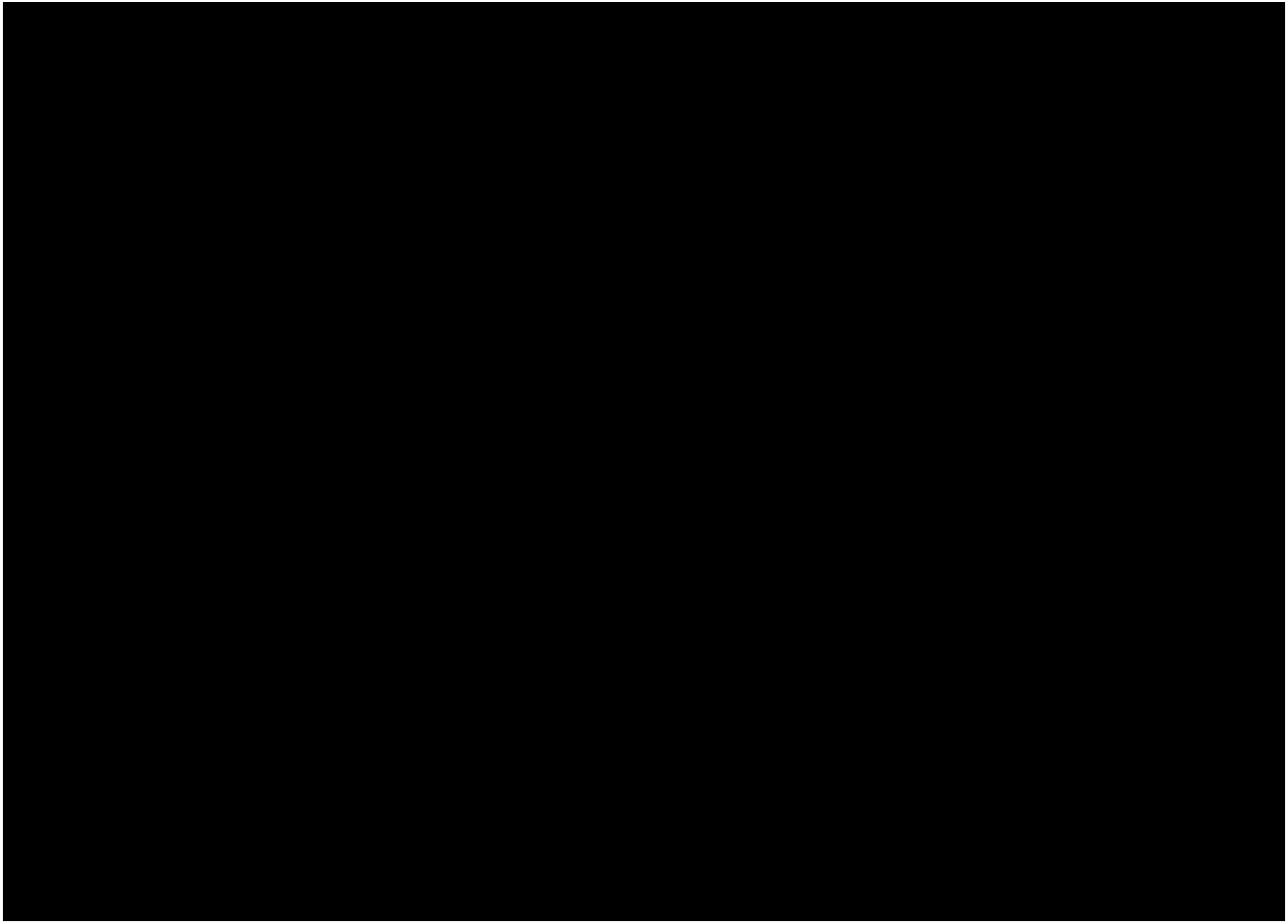


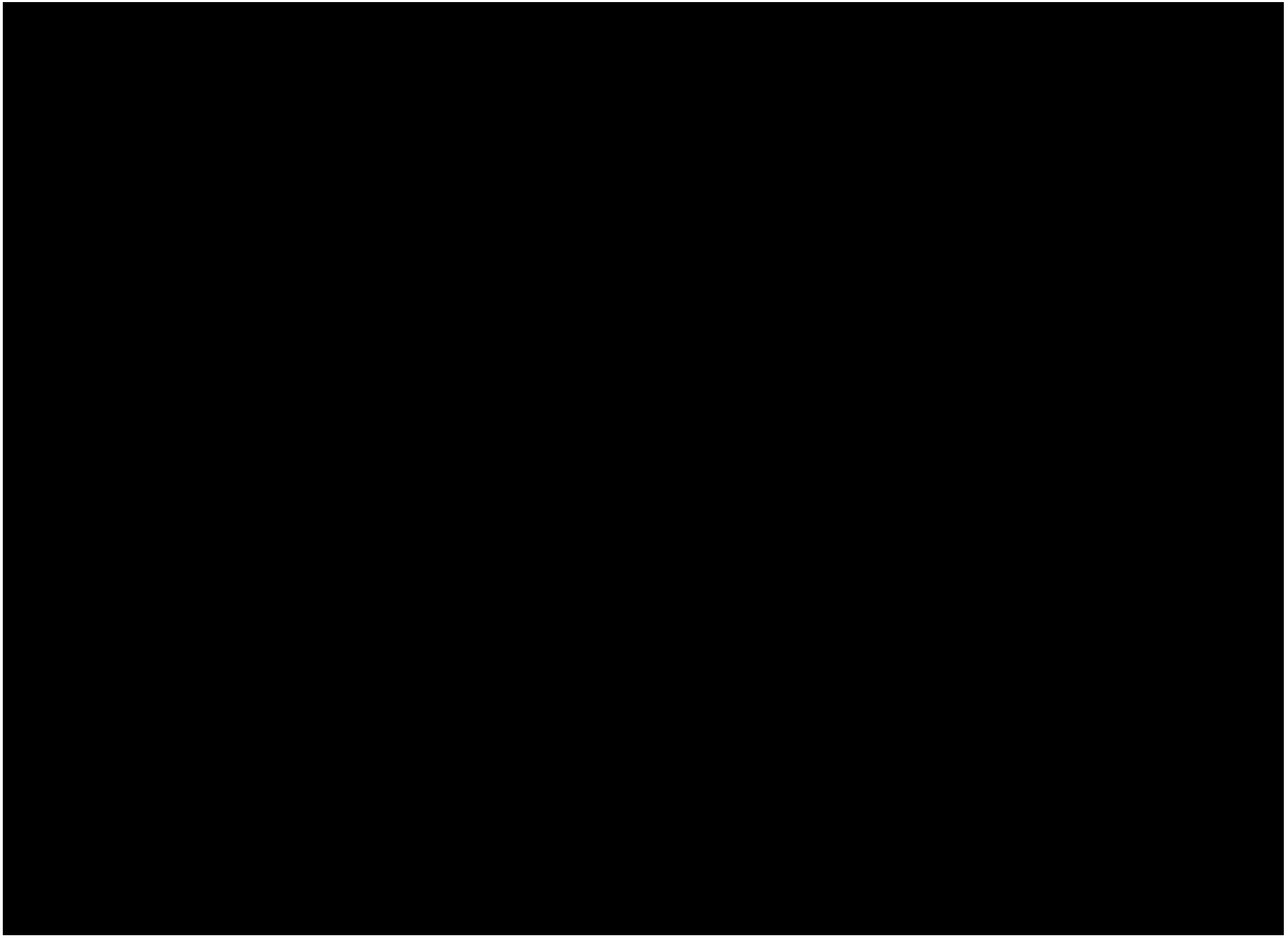












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FLOOD REPORT - NO.7

Egdar Dam Sunny Day Failure followed by Scottts Peak Dam Sunny Day Failulre
20.7m at the Judbury Flood Gauge and Mean Sea Level

Peak discharge at Judbury: 18,850m^3/s

HUON RIVER from JUDBURY to WATERLOO (Huon Estuary), including TAHUNE

Maximum Flood Levels at Bridges	(m gauge)	(m AHD)
Tahune Bridge	24.8	69.6
Weld Rd Bridge	Not estimated	
Judbury Bridge	20.7	31.6
Huonville Bridge	14.4	13.0

Notes

~ The flood levels have been estimated using MIKE Flood software and are relative to the Australian Height Datum (m AHD).
~ Upstream of Judbury the MIKE Flood model is one-deimensional based on 1:25,000 topographic map contours.
~ Downstream of Judbury the MIKE Flood model is 2D with the floodplain based on LiDAR from Geoscience Australia and the river channel based on a variety of survey sources.

~ Coordinates are MGA (Map Grid of Australia), Zone 55.
~ For zones, refer to Appendix C of the FEP.

~ Emergency services should check maps (e.g. Street Atlas) for nearby properties that may be affected.
~ Buildings with floor levels greater than 1.0m above the predicted flood level are not included in this table.

Summary of flooded infrastructure

Bridges

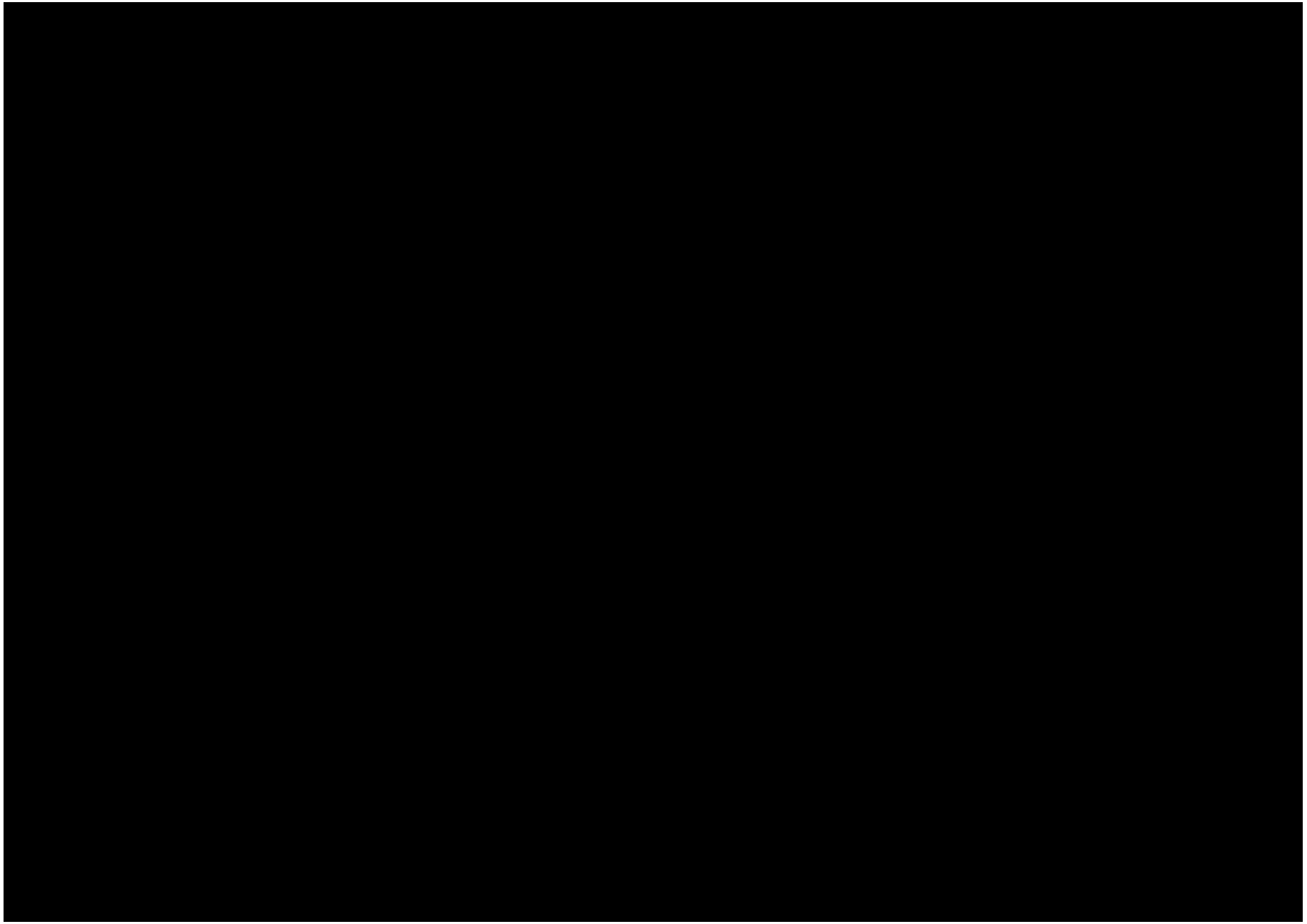
	Roads	Easting	Northing	Estimated depth (m)	Comment
1	Channel Highway	504420	5235080	Greater than 1m	Significant length of Highway inundated between Huonville and Cradoc Hill Road
2	Wilmot Road near Mountain Creek bridge	503411	5237036	Greater than 1m	Inundated for full length.
3	Glen Huon Road, approx 1km from Huon Bridge	503012	5236139	Greater than 1m	Inundated at numerous locations along its length.
4	Huon Highway	502008	5236183	Greater than 1m	Significant length of Highway inundated between Huonville and Port Huon.
5	Huonville	503870	5235590	Greater than 1m	All roads and streets in Huonville town centre inundated.

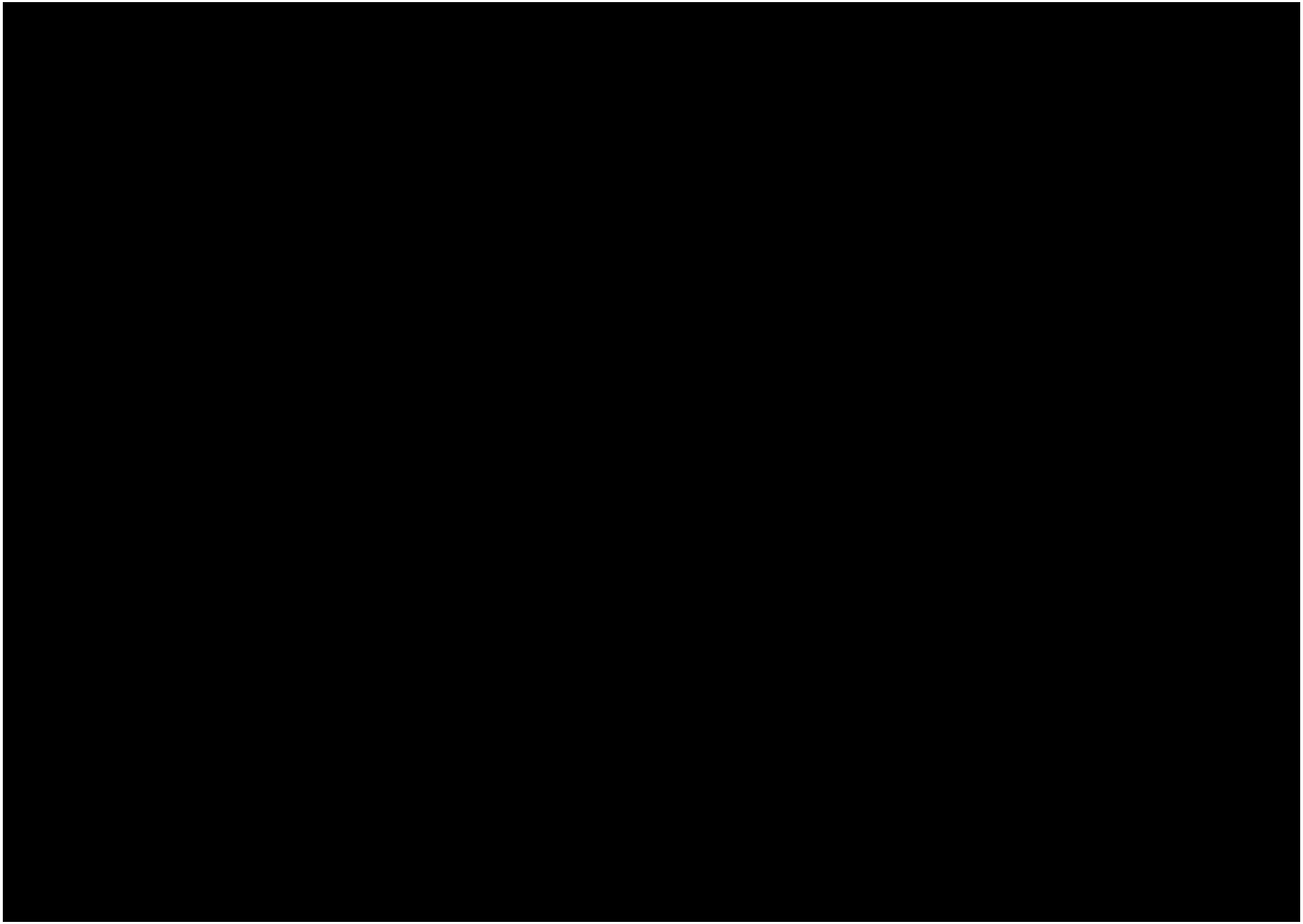
	Bridges	Easting	Northing	Estimated depth (m)	Comment
1	Tahune Bridge	477907	5228581	18.7	Bridge overtopped - likely to be washed away.
2	Weld Rd Bridge	485244	5232805		Bridge overtopped - likely to be washed away.
3	Judbury Bridge	494165	5239266	9.9	Bridge overtopped - likely to be washed away.
4	Huonville Bridge	503785	5235423	8.9	Bridge overtopped - likely to be washed away.

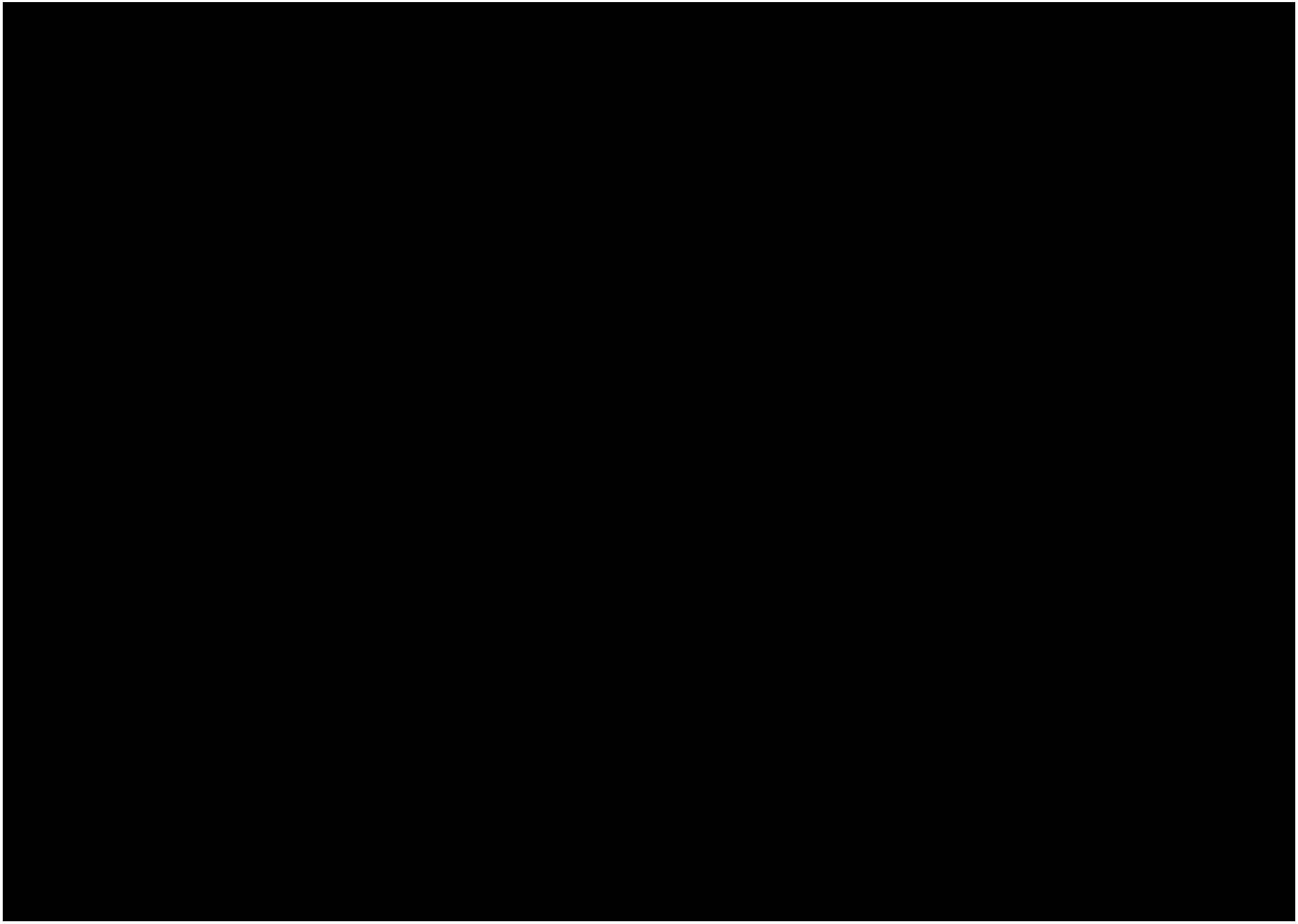
1. Tahune bridge deck level: 50.9 m AHD approx
2. Weld Road bridge deck level: 39.7 m AHD from SPM10617
3. Judbury bridge deck level: 21.71 m AHD from SPM9697 (southern side of bridge). SPM = State Permanent Mark (survey mark).
4. Huonville Bridge deck level: 4.12 m AHD, HTC Survet Station 680 (northern side of bridge at intersection with Channel Highway).

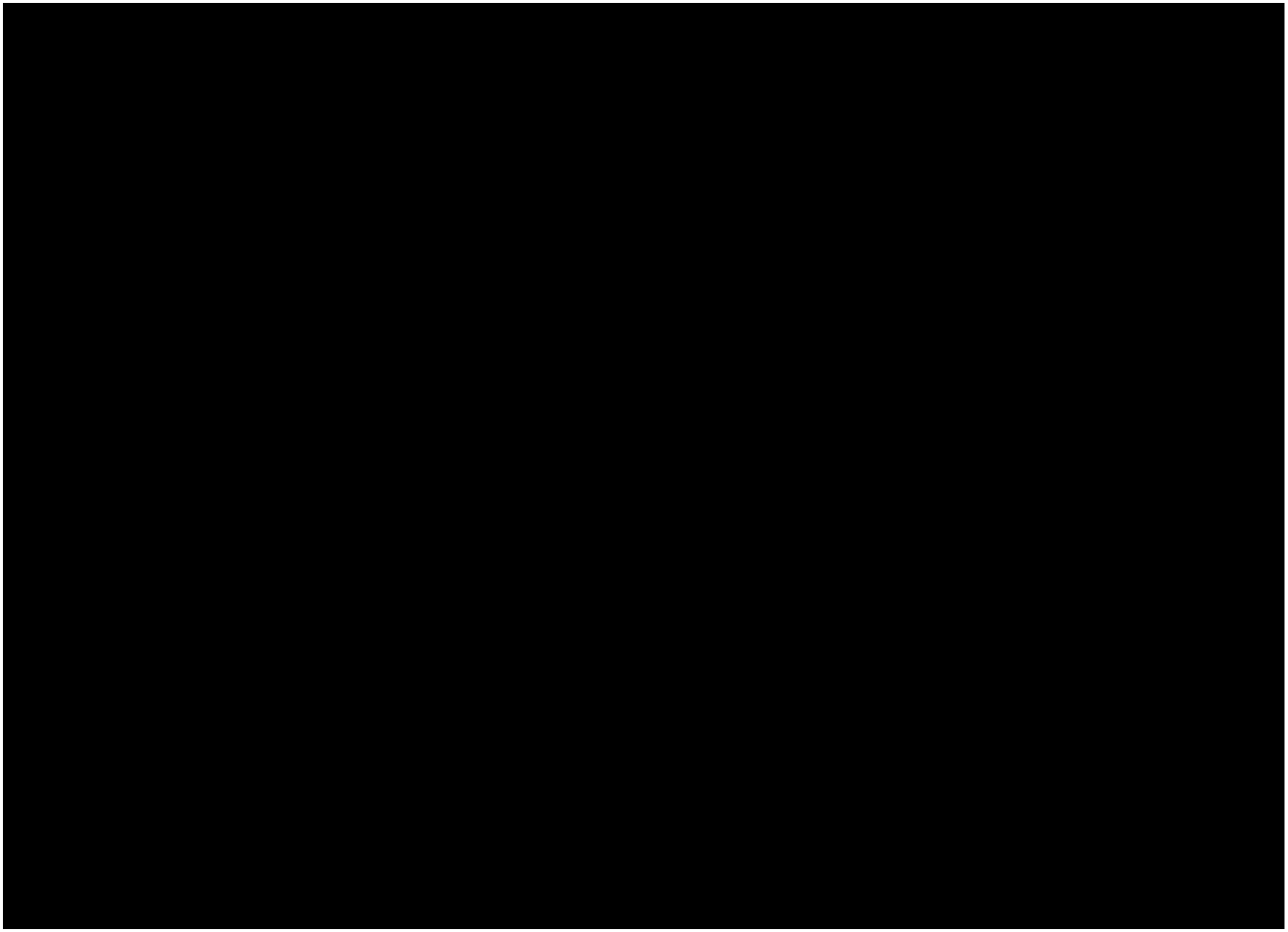
Summary of number of properties threatened

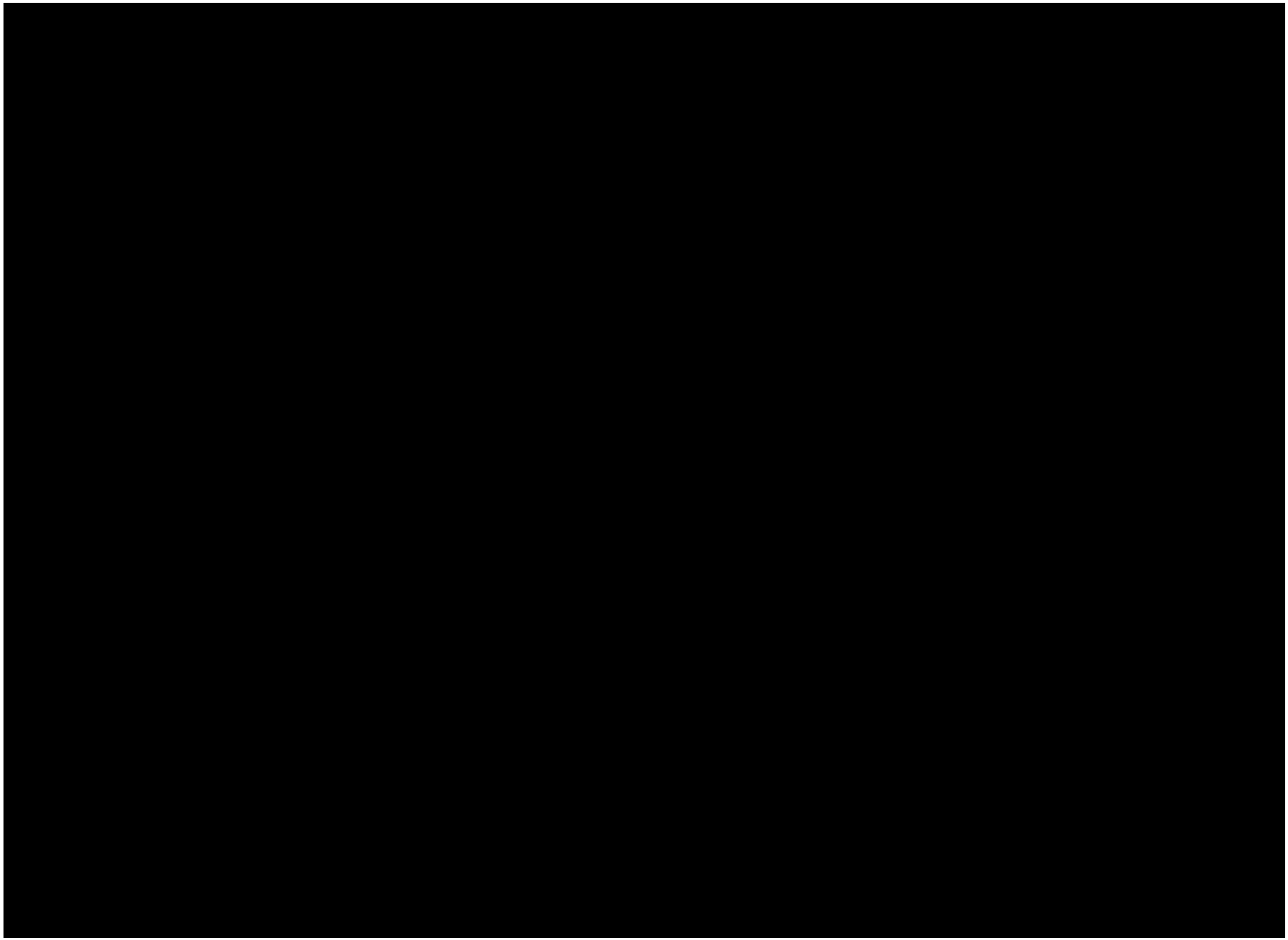
Zone	Area Name	No.
A	Judbury area including Tahune (north of Huon River)	17
B	Judbury-Glen Huon area (south of Huon River)	42
C	Ranelagh	20
D	Wilmot Street, Huonville (past school oval)	68
E	Main Street, Huonville (north of Shield Street)	123
F	Central Huonville	370
G	Flood Road area (eastern Huonville)	72
H	Franklin area, Huon Highway	155
I	Channel Highway	11
J	South of Castle Forbes Bay, Huon Highway	1
K	Cygnet Coast Road (southern section)	3
	Total	882

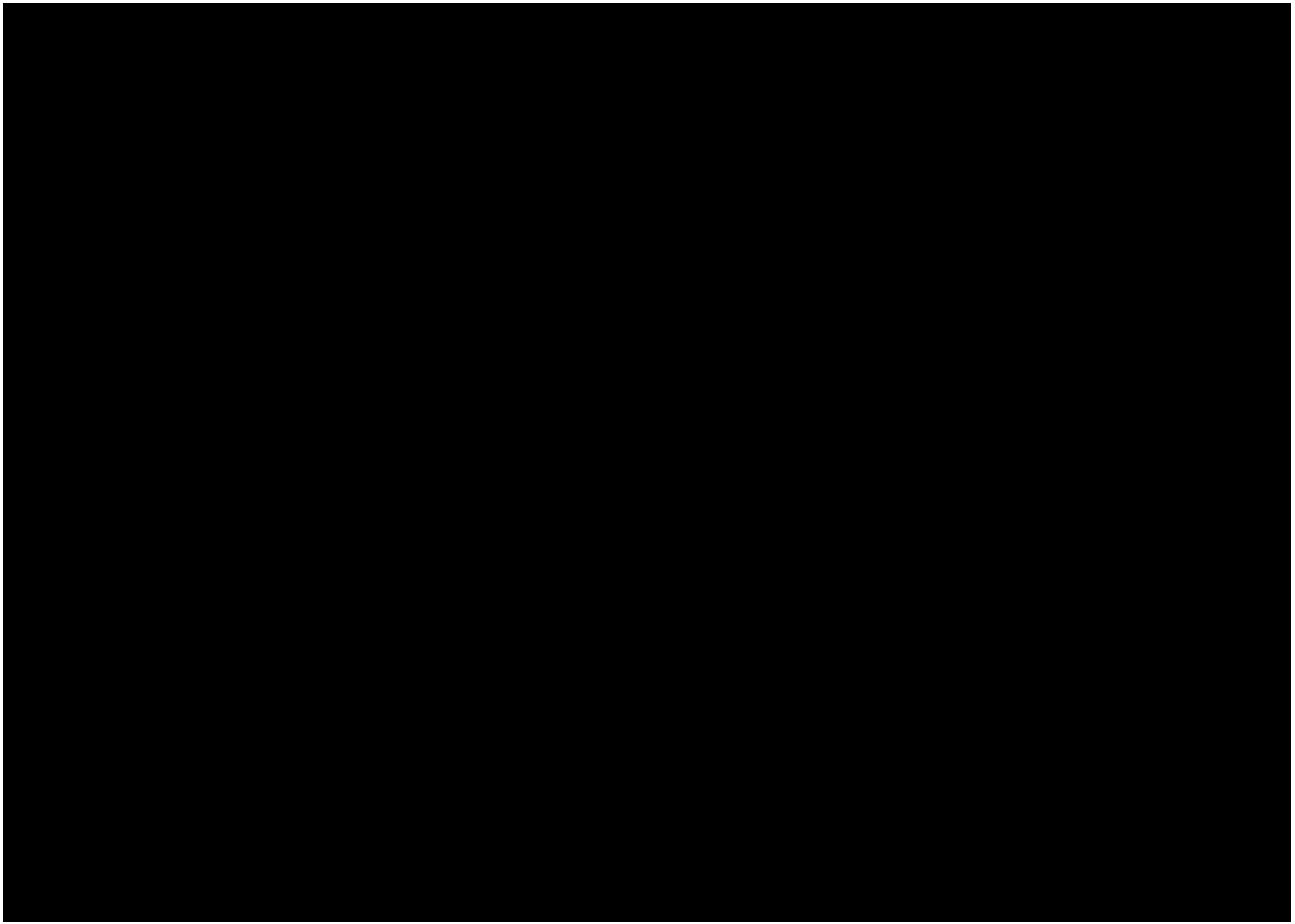


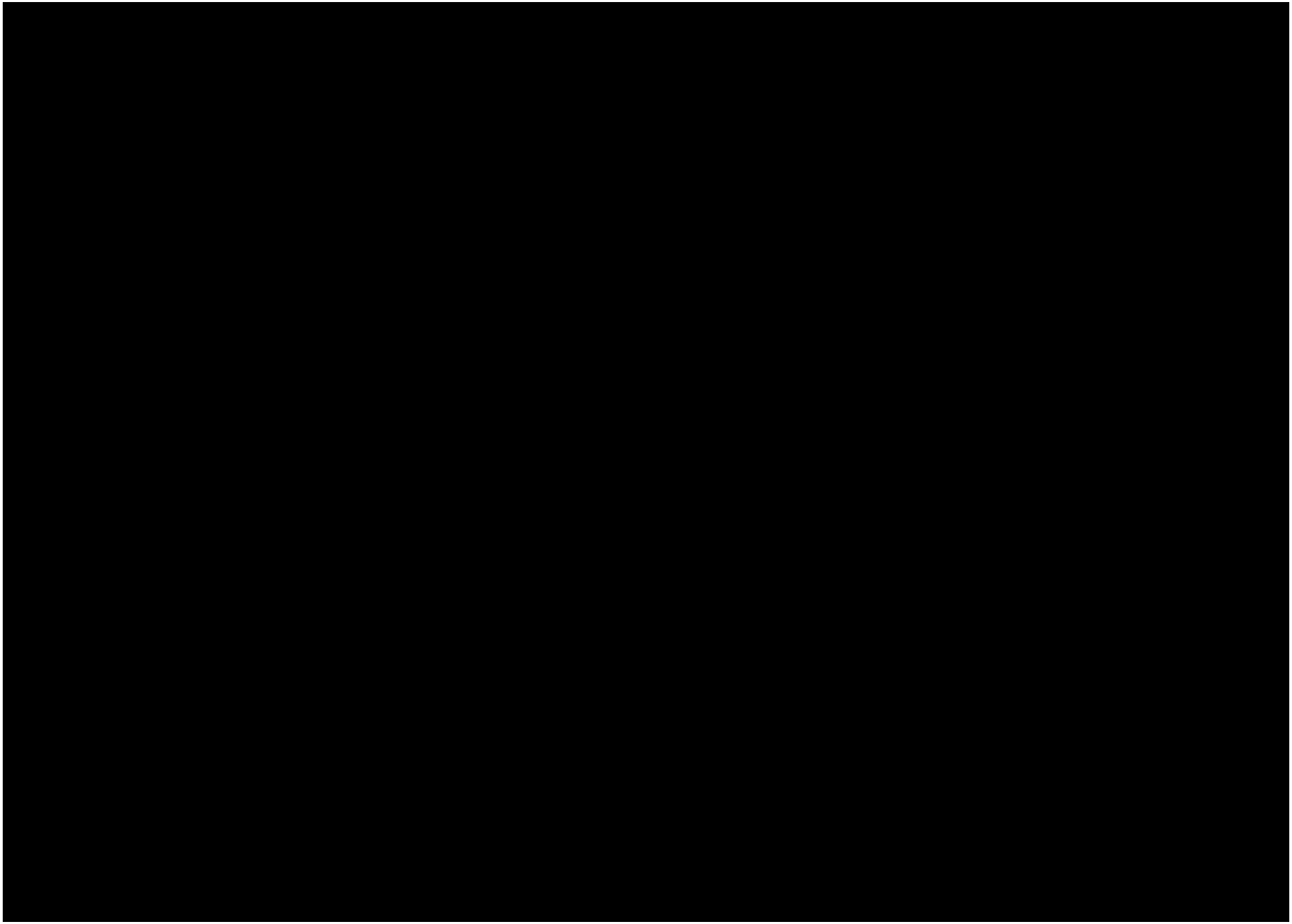


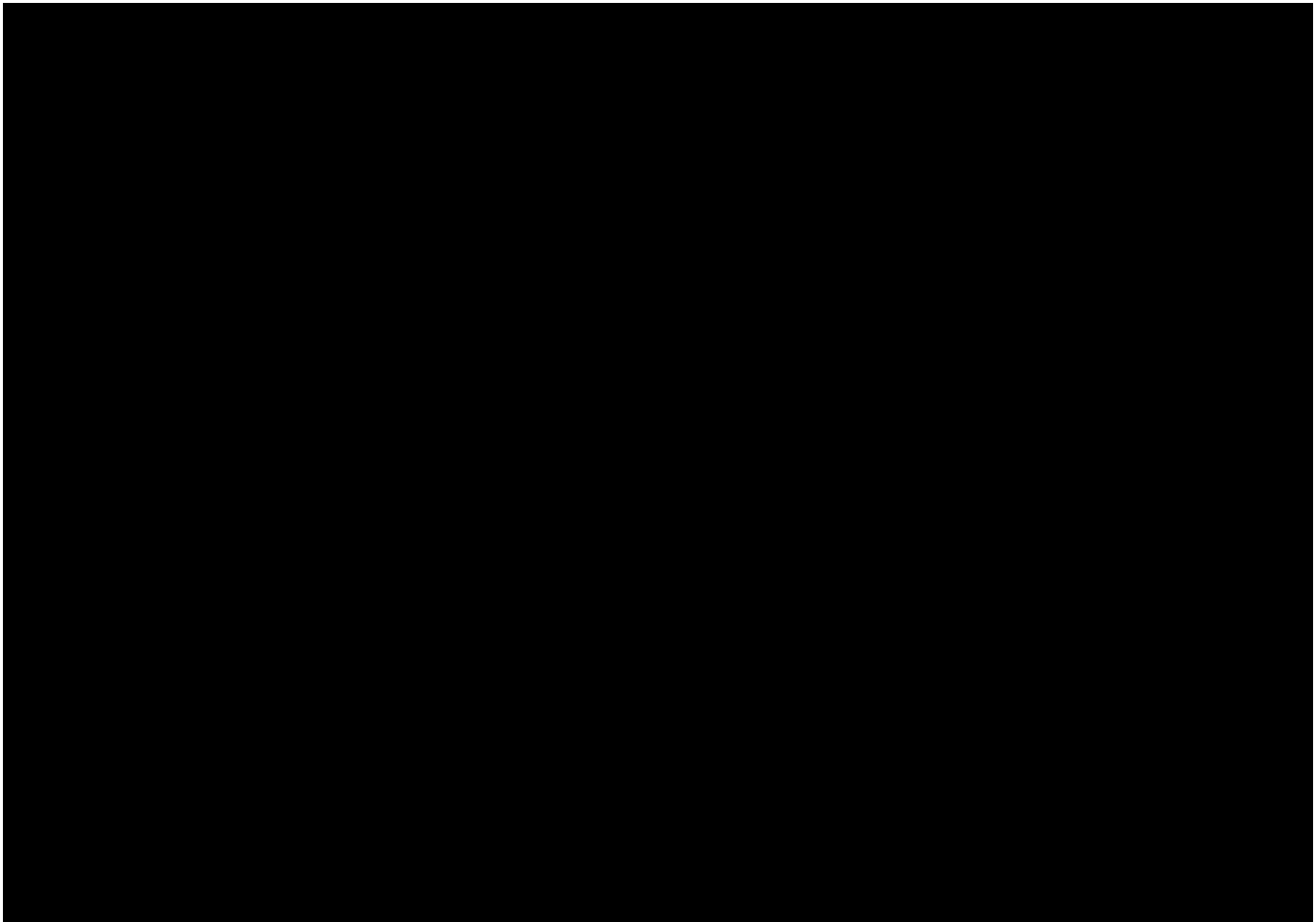


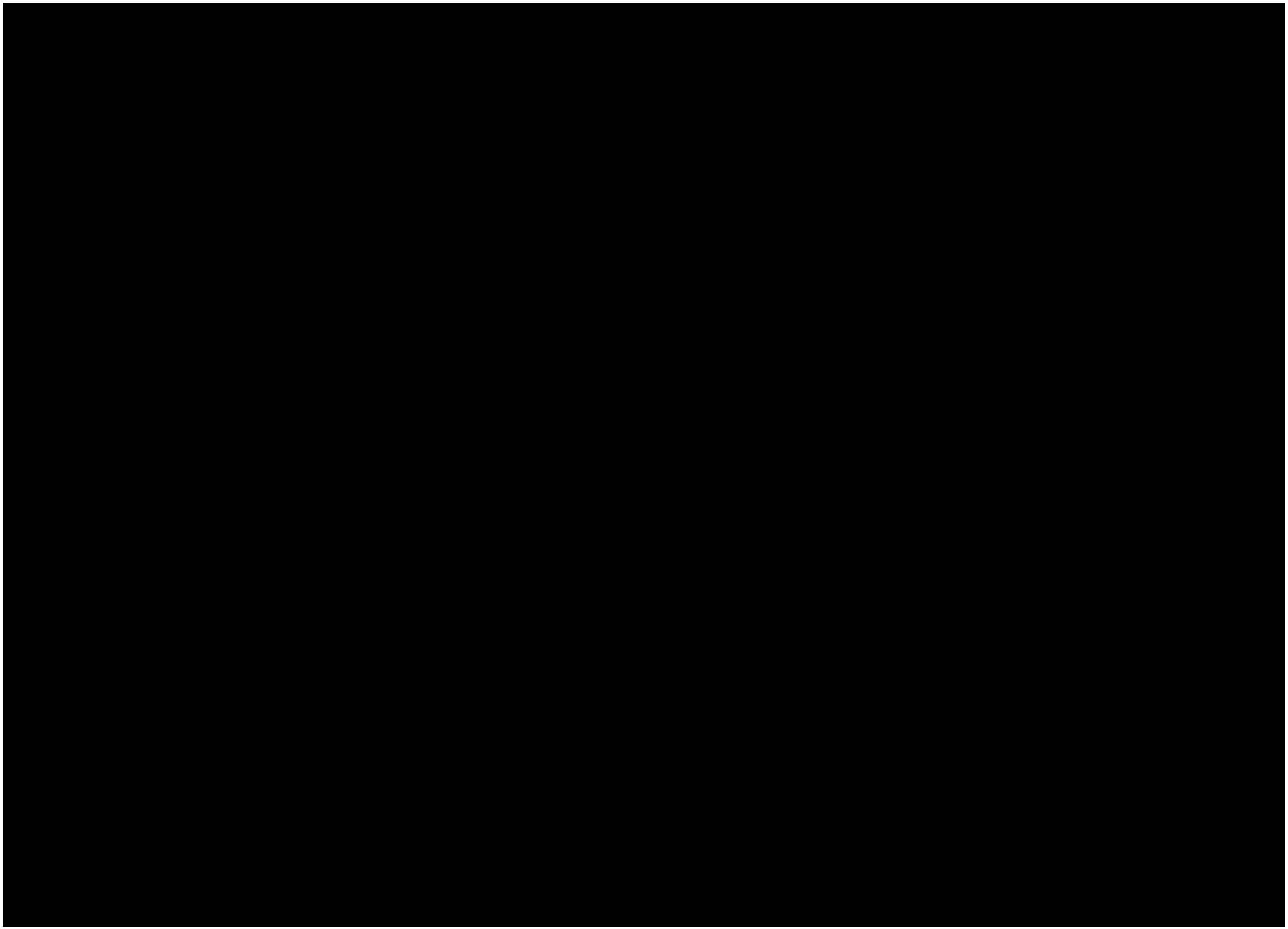


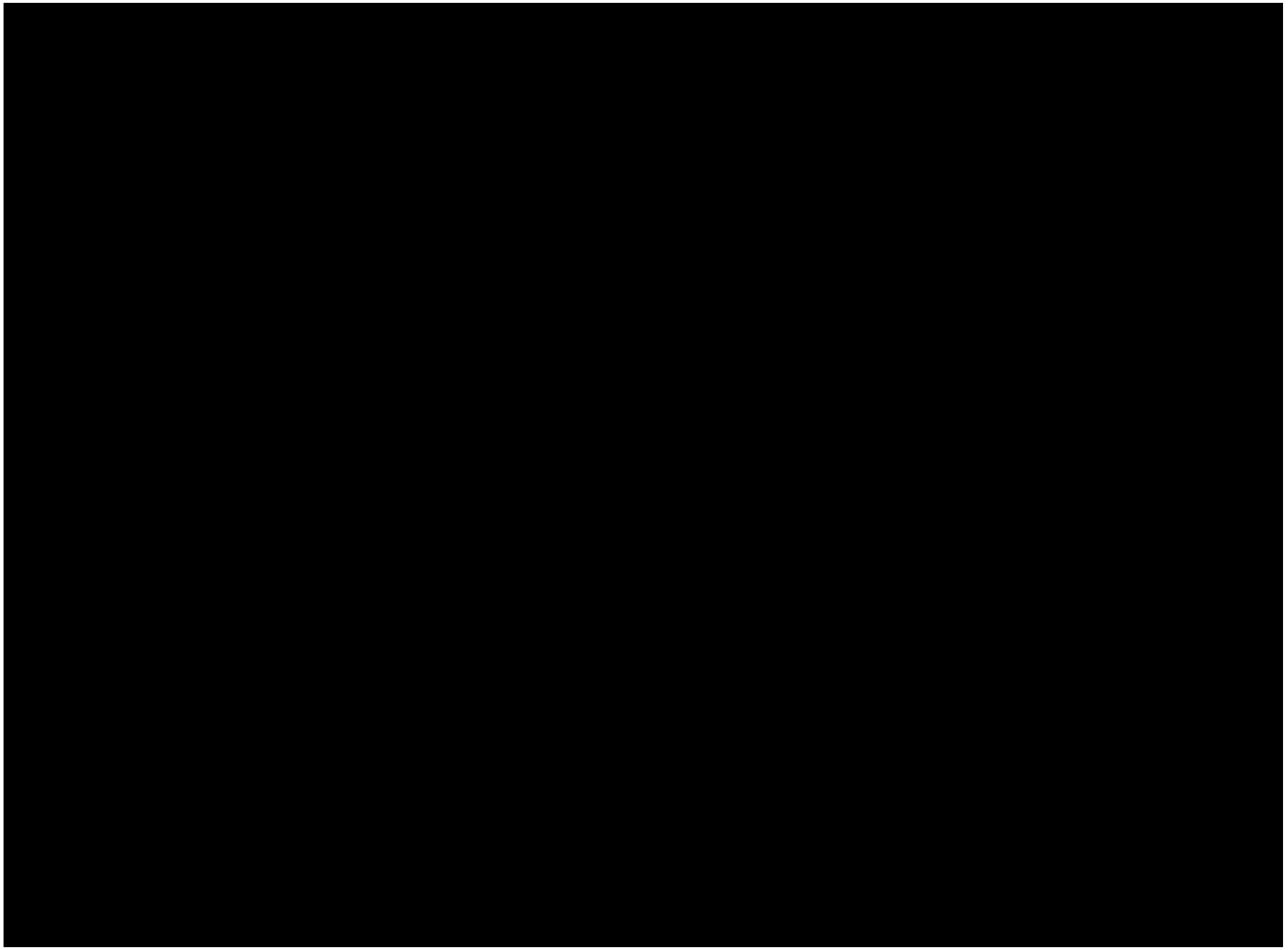


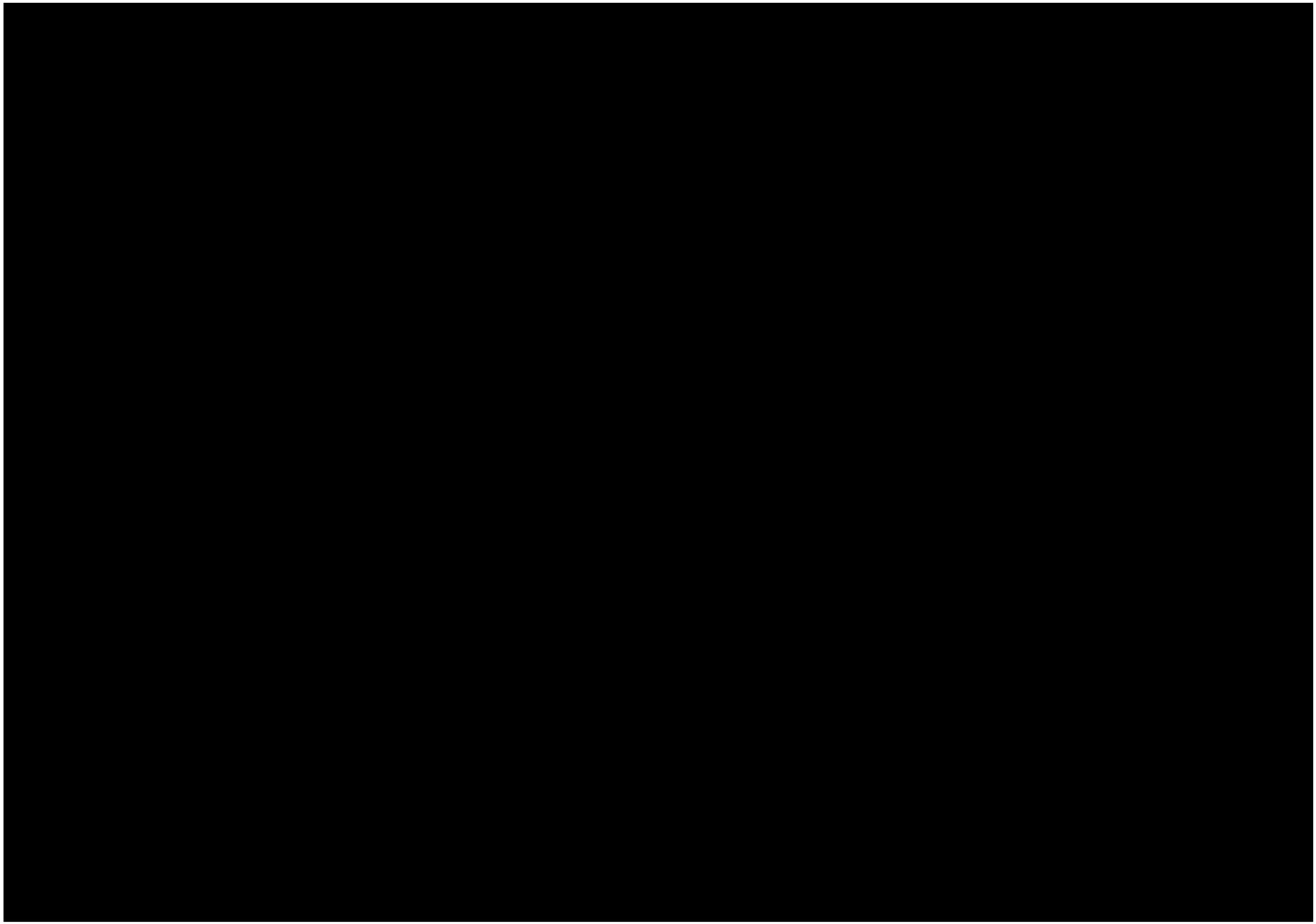


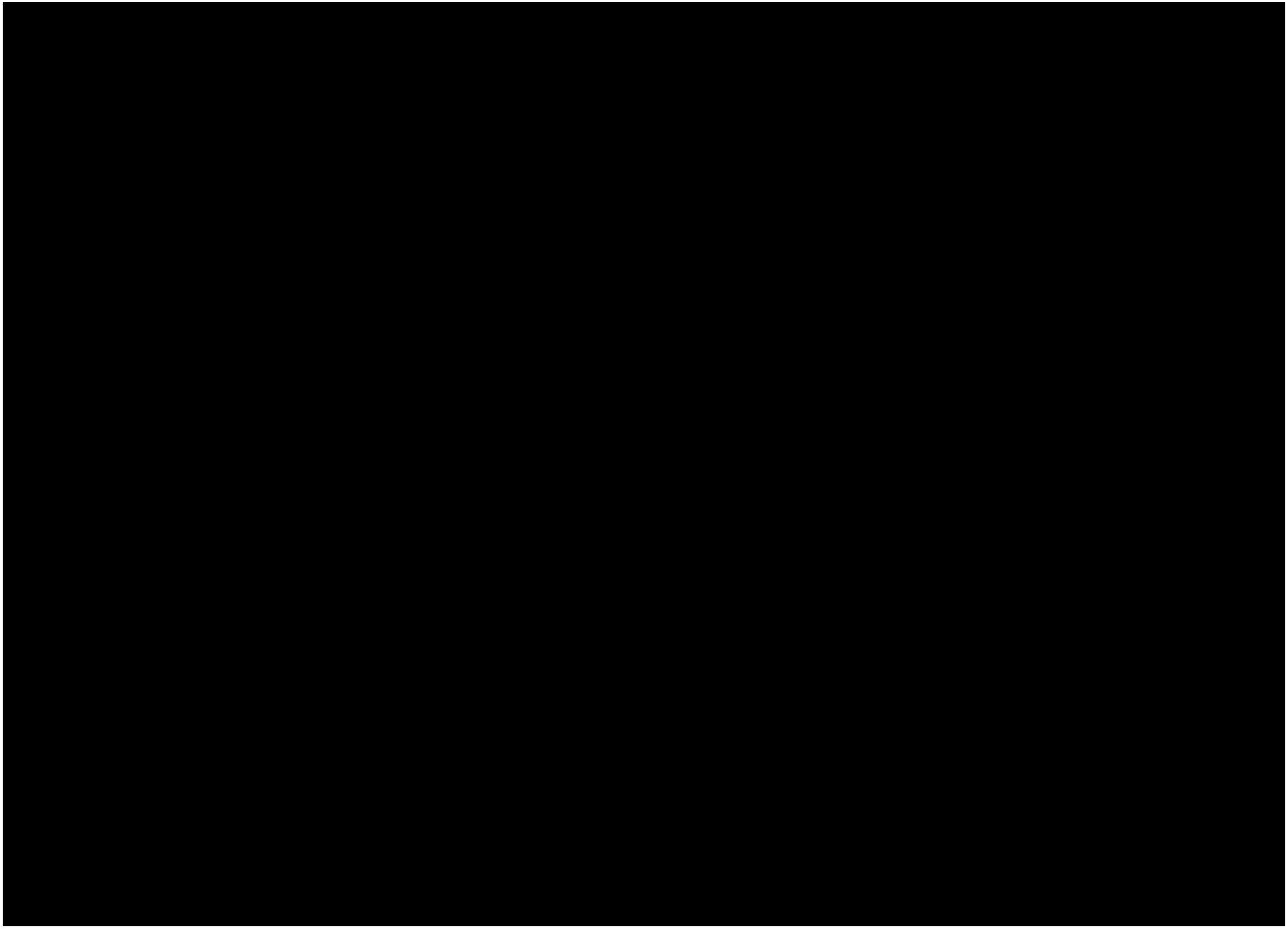


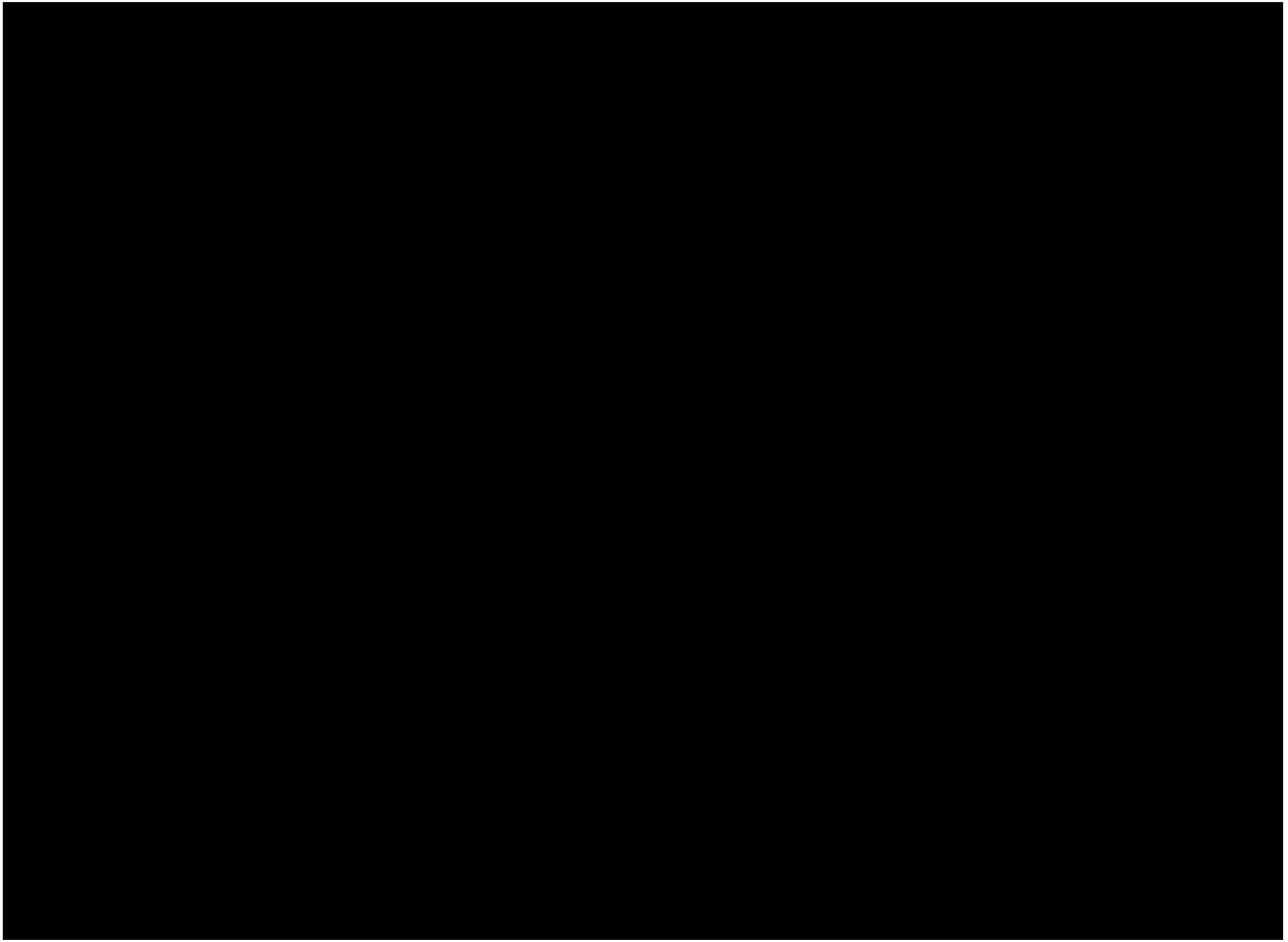


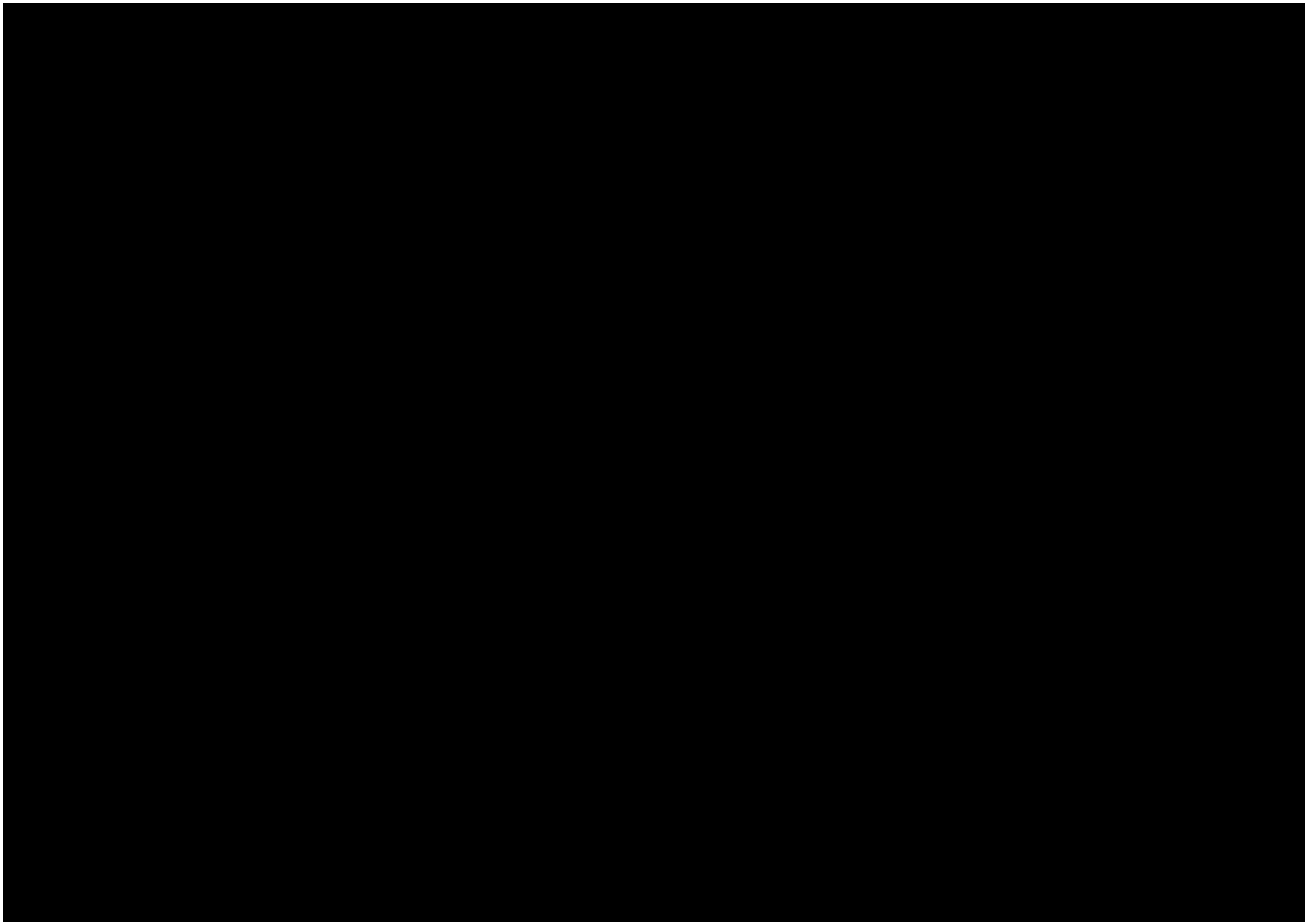


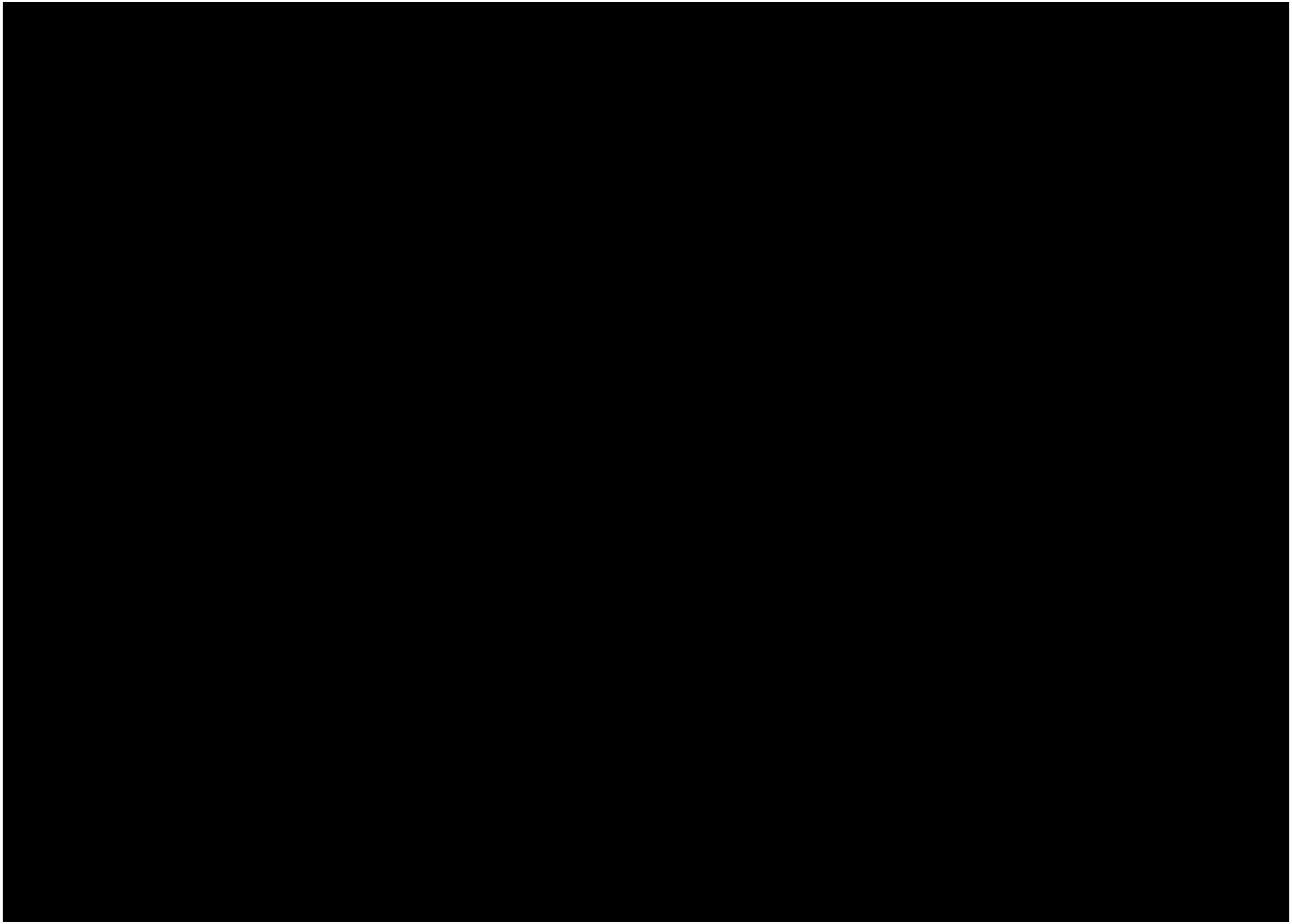


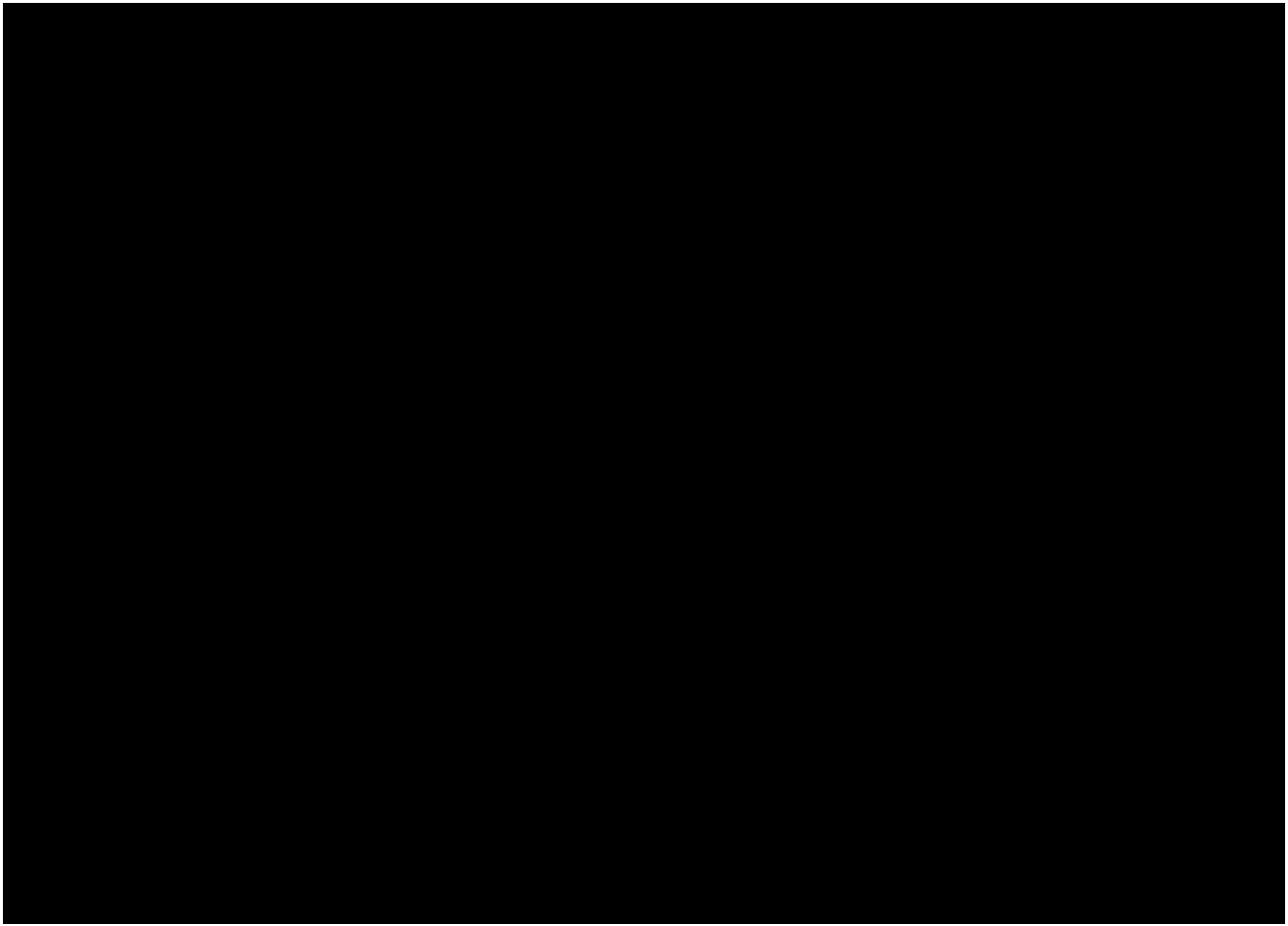


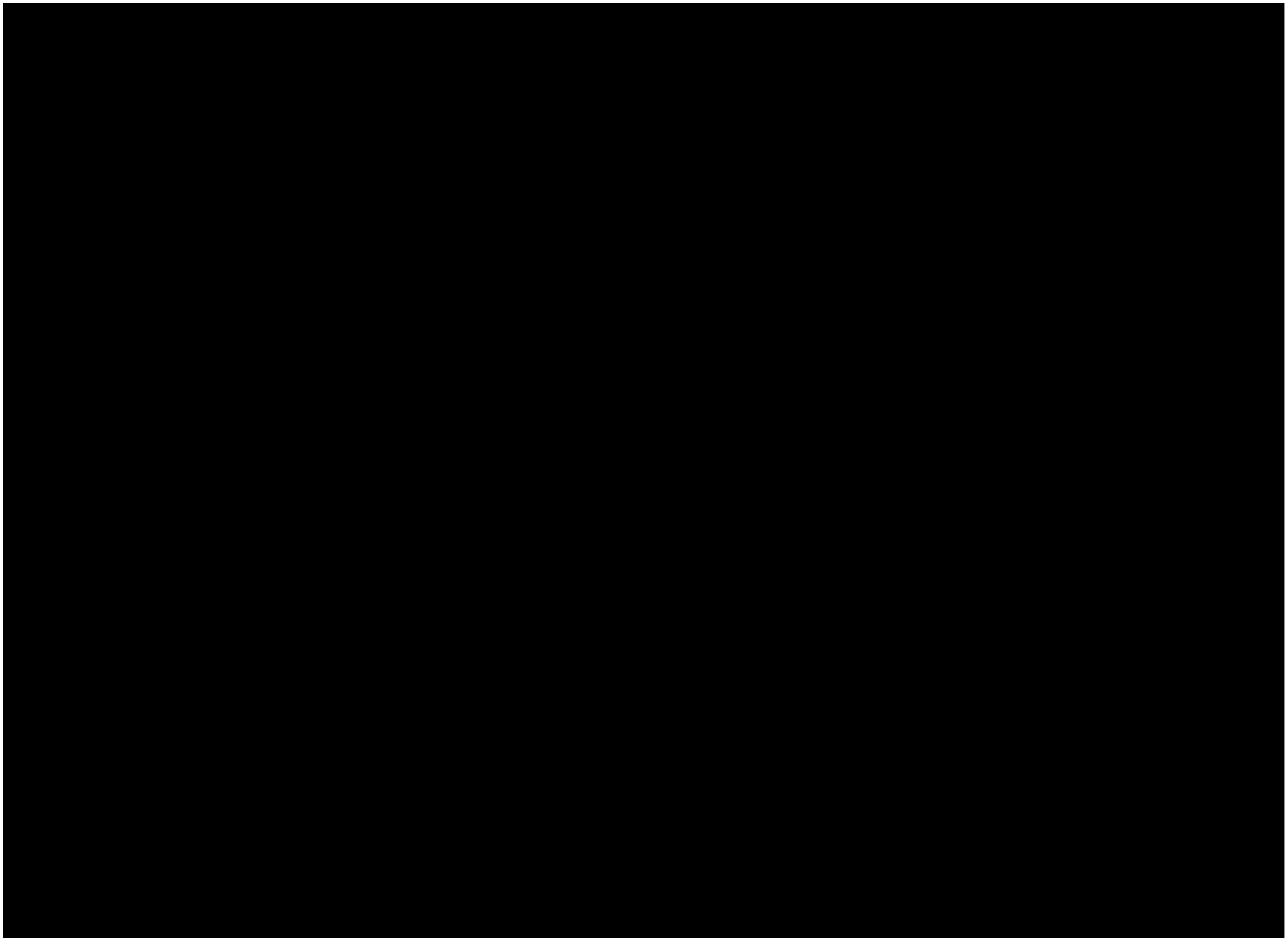


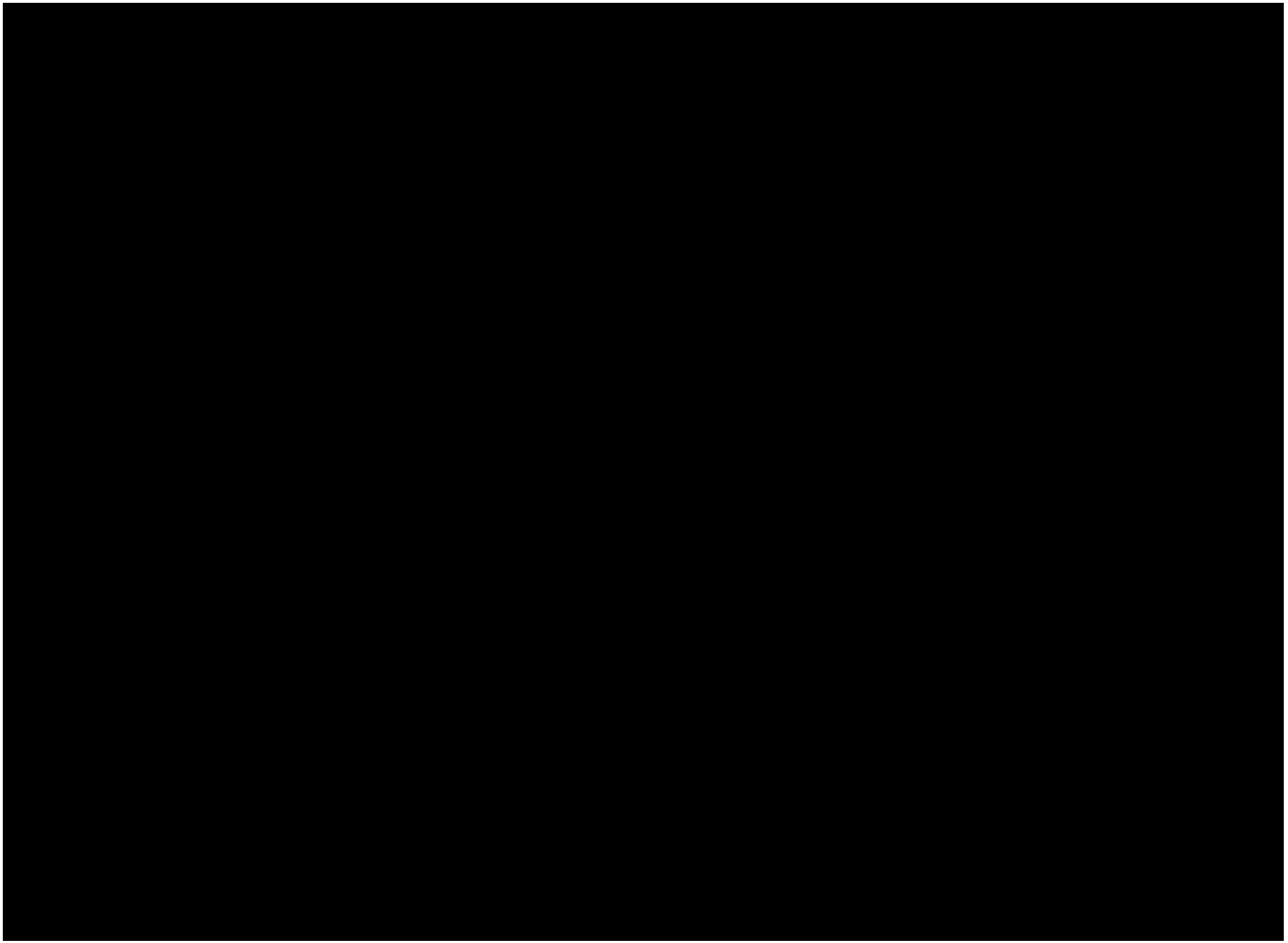


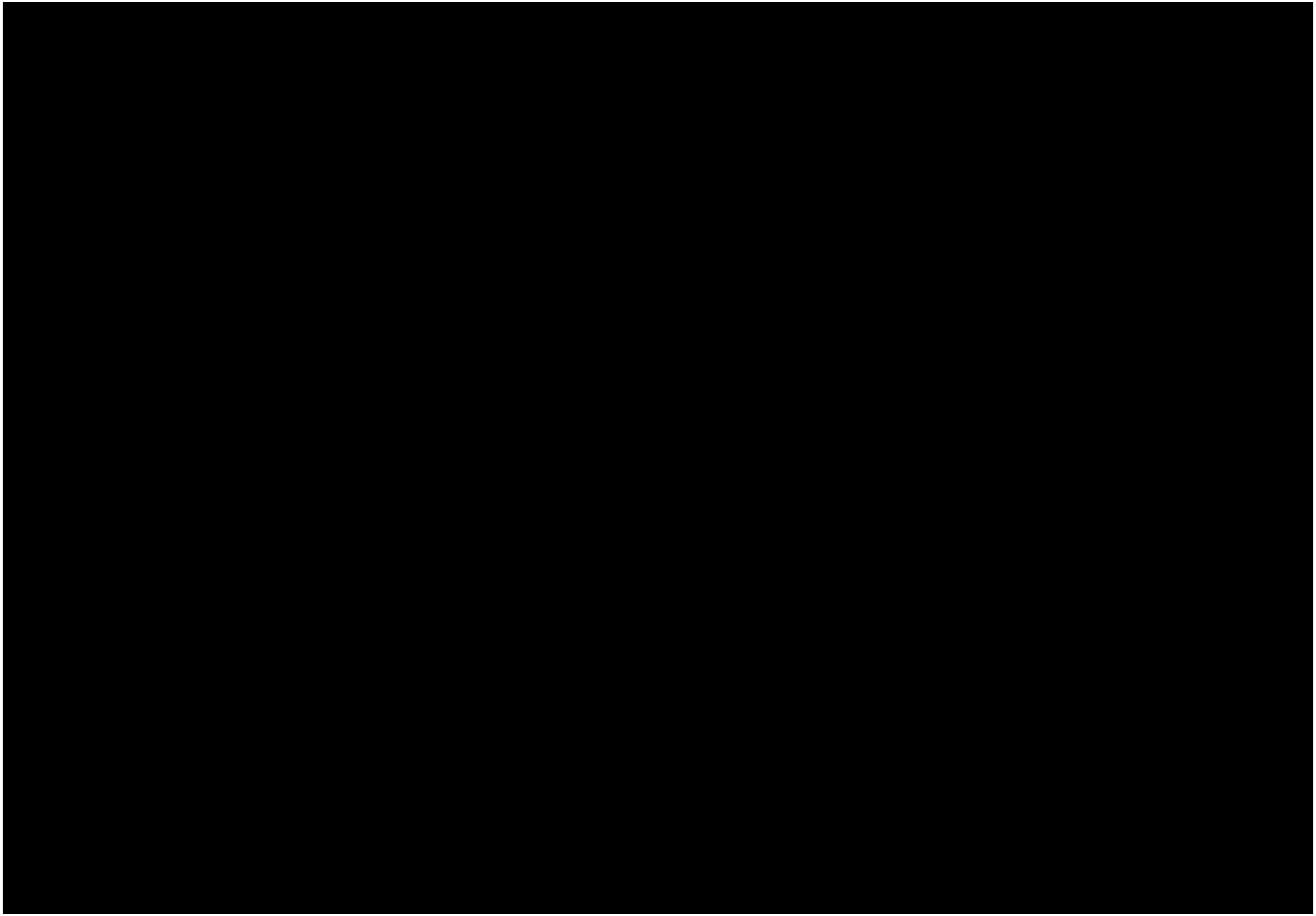












FLOOD REPORT - NO.8

Scotts Peak East Saddle Dam - Sunny Day Failure
14.6m at the Judbury Flood Gauge and Mean Sea Level
Peak discharge at Judbury: 7,470m^3/s
HUON RIVER from JUDBURY to WATERLOO (Huon Estuary), including TAHUNE

Maximum Flood Levels at Bridges	(m gauge)	(m AHD)
Tahune Bridge	18.5	63.3
Weld Rd Bridge	Not estimated	
Judbury Bridge	14.6	25.5
Huonville Bridge	9.8	8.4

Notes
~ The flood levels have been estimated using MIKE Flood software and are relative to the Australian Height Datum (m AHD).
~ Upstream of Judbury the MIKE Flood model is one-deimensional based on 1:25,000 topographic map contours.
~ Downstream of Judbury the MIKE Flood model is 2D with the floodplain based on LiDAR from Geoscience Australia and the river channel based on a variety of survey sources.

~ Coordinates are MGA (Map Grid of Australia), Zone 55.
~ For zones, refer to Appendix C of the FEP.

~ Emergency services should check maps (e.g. Street Atlas) for nearby properties that may be affected.
~ Buildings with floor levels greater than 1.0m above the predicted flood level are not included in this table.

Summary of flooded infrastructure

Bridges

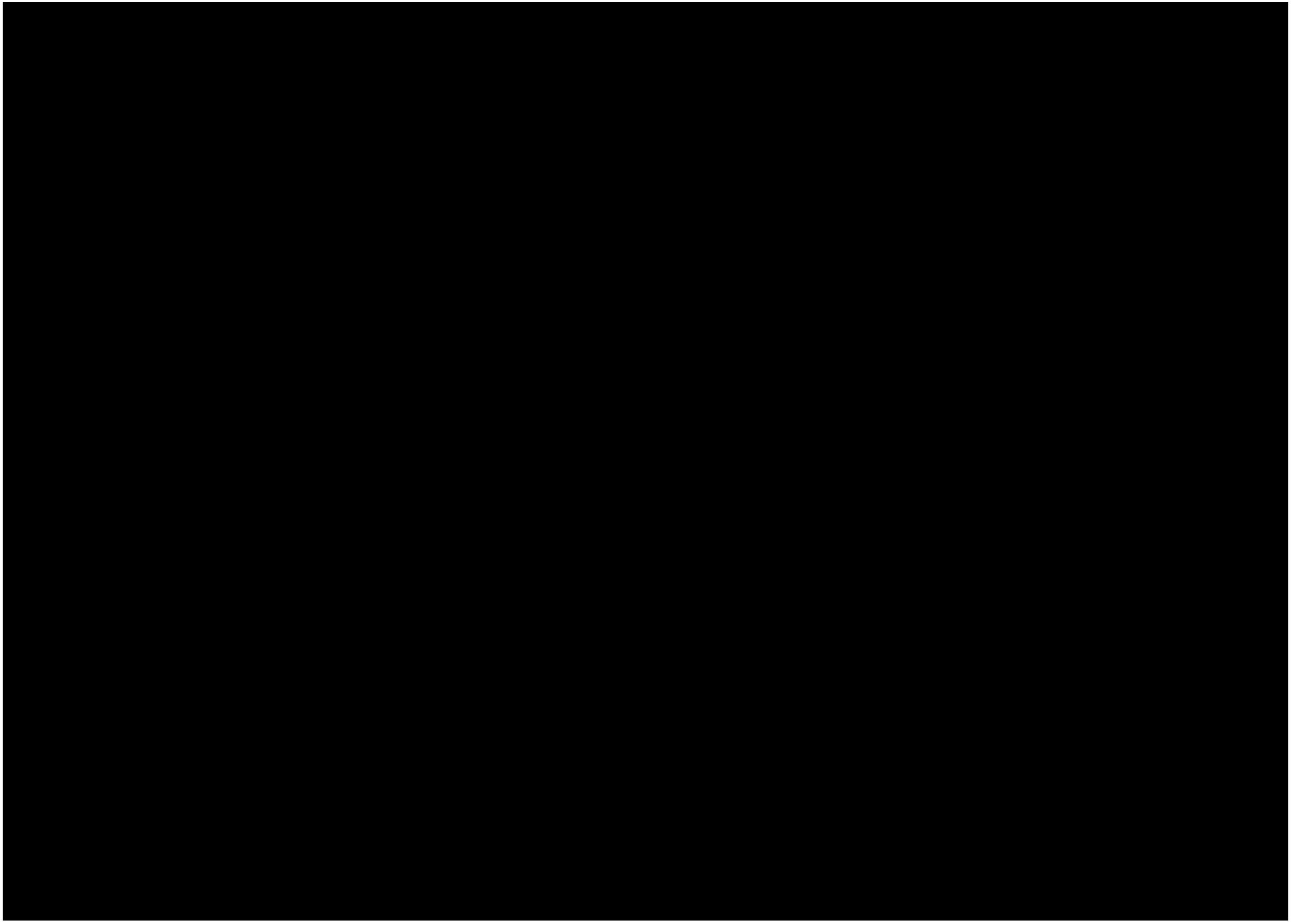
	Roads	Easting	Northing	Estimated depth (m)	Comment
1	Channel Highway	504420	5235080	Greater than 1m	Significant length of Highway inundated between Huonville and Cradoc Hill Road
2	Wilmot Road near Mountain Creek bridge	503411	5237036	Greater than 1m	Inundated for full length.
3	Glen Huon Road, approx 1km from Huon Bridge	503012	5236139	Greater than 1m	Inundated at numerous locations along its length.
4	Huon Highway	502008	5236183	Greater than 1m	Significant length of Highway inundated between Huonville and Port Huon.
5	Huonville	503870	5235590	Greater than 1m	All roads and streets in Huonville town centre inundated.

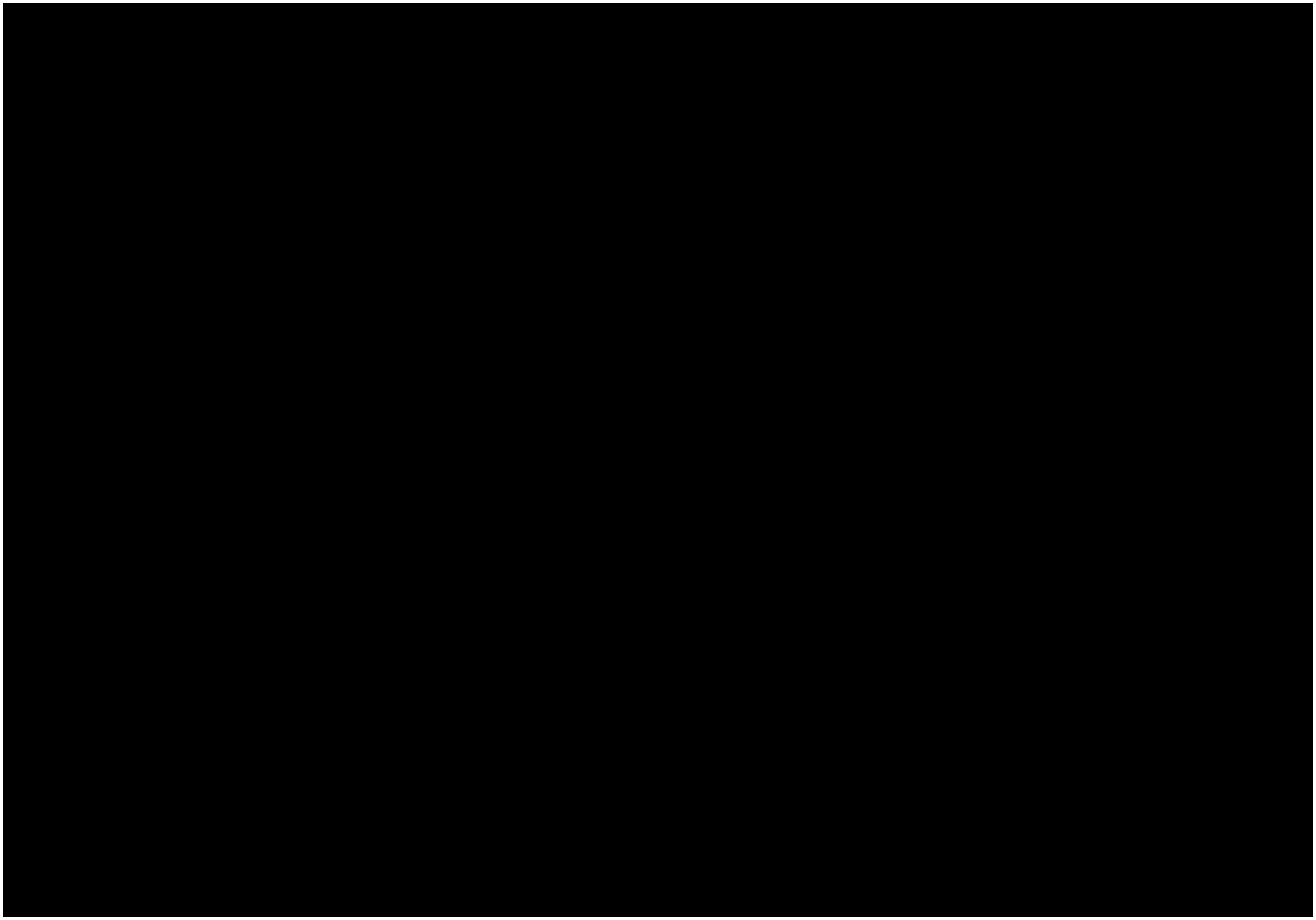
	Bridges	Easting	Northing	Estimated depth (m)	Comment
1	Tahune Bridge	477907	5228581	12.4	Bridge overtopped - likely to be washed away.
2	Weld Rd Bridge	485244	5232805		Bridge overtopped - likely to be washed away.
3	Judbury Bridge	494165	5239266	3.8	Bridge overtopped - likely to be washed away.
4	Huonville Bridge	503785	5235423	4.3	Bridge overtopped - likely to be washed away.

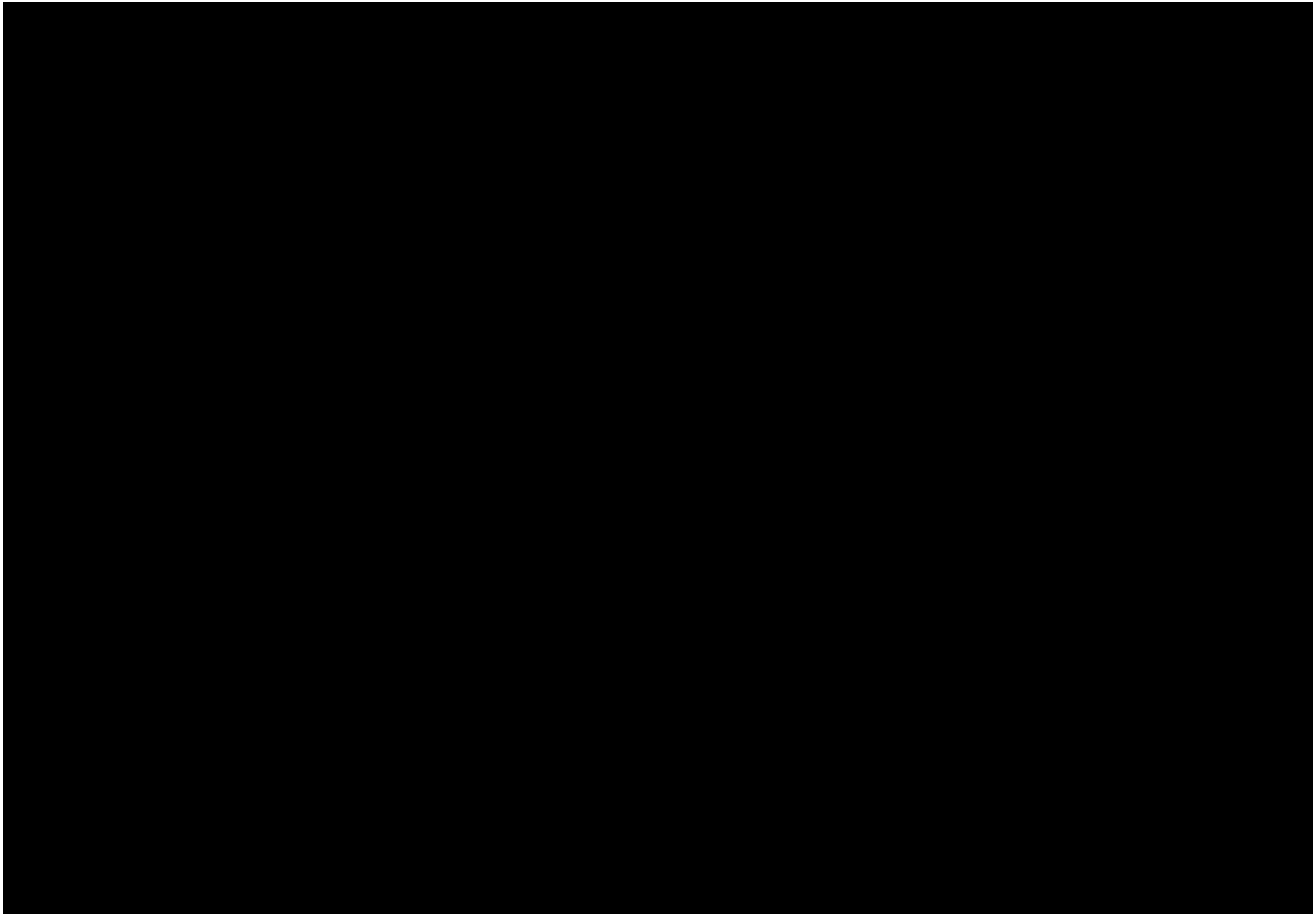
1. Tahune bridge deck level: 50.9 m AHD approx
2. Weld Road bridge deck level: 39.7 m AHD from SPM10617
3. Judbury bridge deck level: 21.71 m AHD from SPM9697 (southern side of bridge). SPM = State Permanent Mark (survey mark).
4. Huonville Bridge deck level: 4.12 m AHD, HTC Survet Station 680 (northern side of bridge at intersection with Channel Highway).

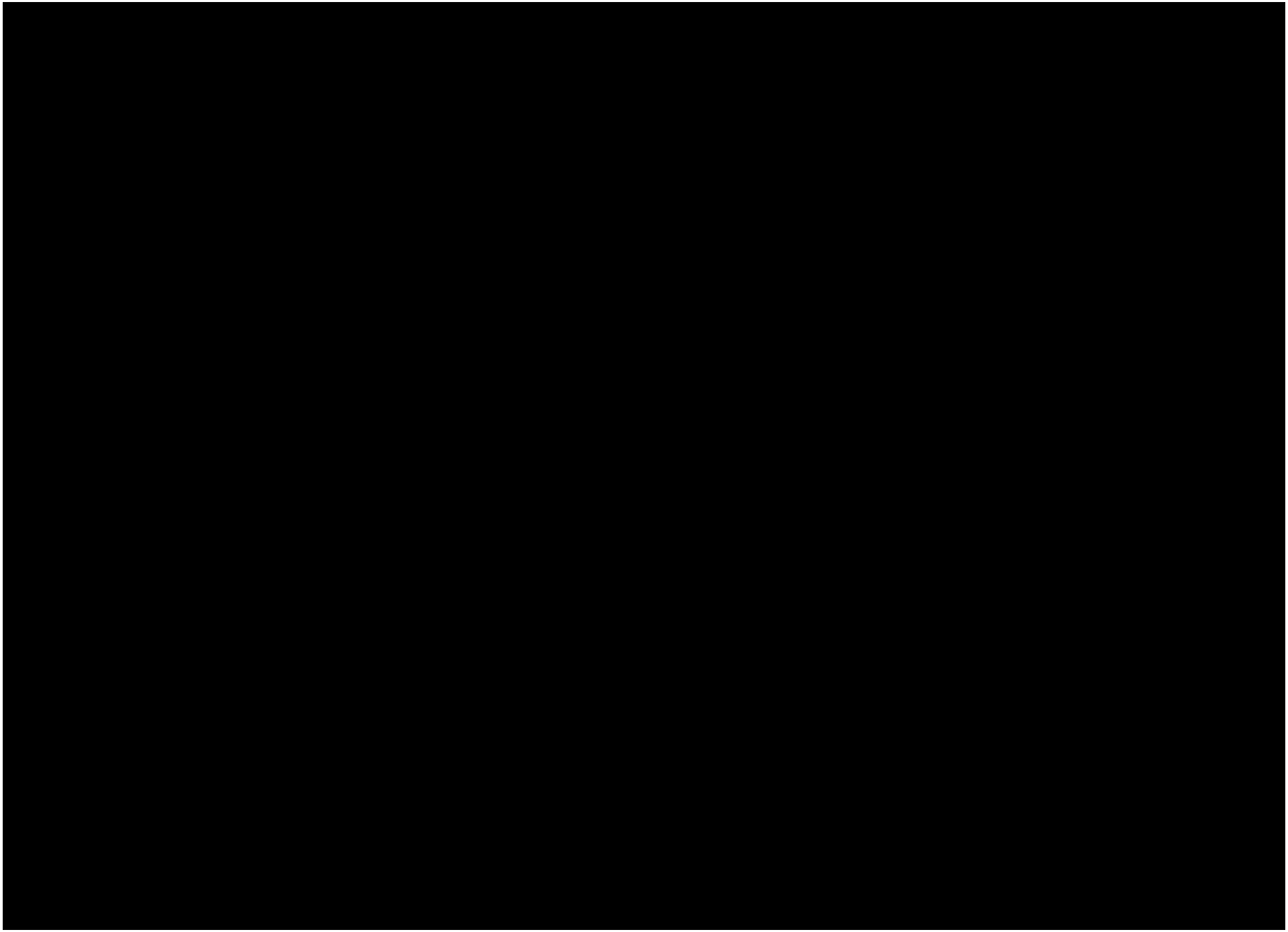
Summary of number of properties threatened

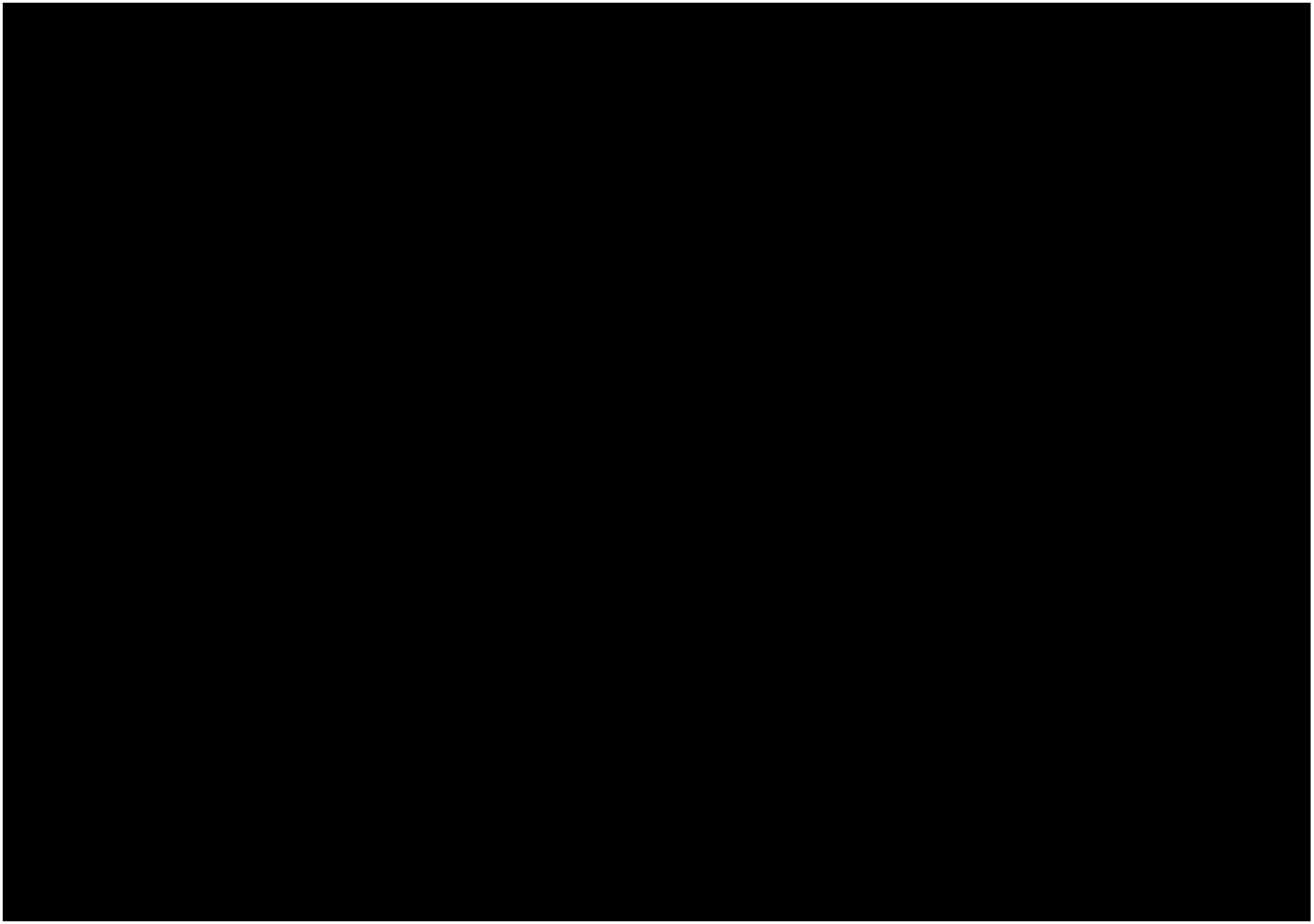
Zone	Area Name	No.
A	Judbury area including Tahune (north of Huon River)	10
B	Judbury-Glen Huon area (south of Huon River)	26
C	Ranelagh	3
D	Wilmot Street, Huonville (past school oval)	67
E	Main Street, Huonville (north of Shield Street)	37
F	Central Huonville	334
G	Flood Road area (eastern Huonville)	26
H	Franklin area, Huon Highway	85
I	Channel Highway	7
J	South of Castle Forbes Bay, Huon Highway	0
K	Cygnet Coast Road (southern section)	1
	Total	596

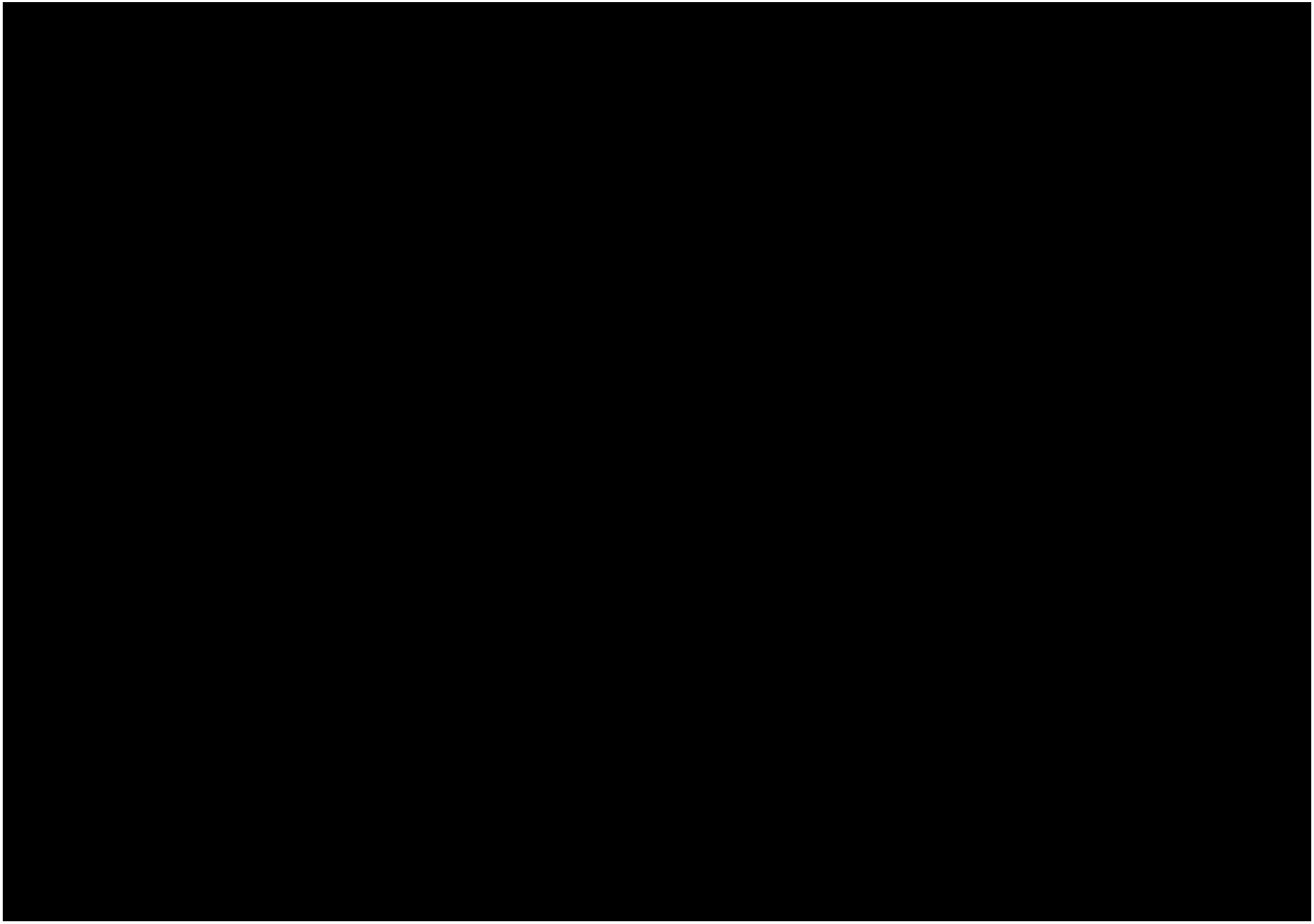


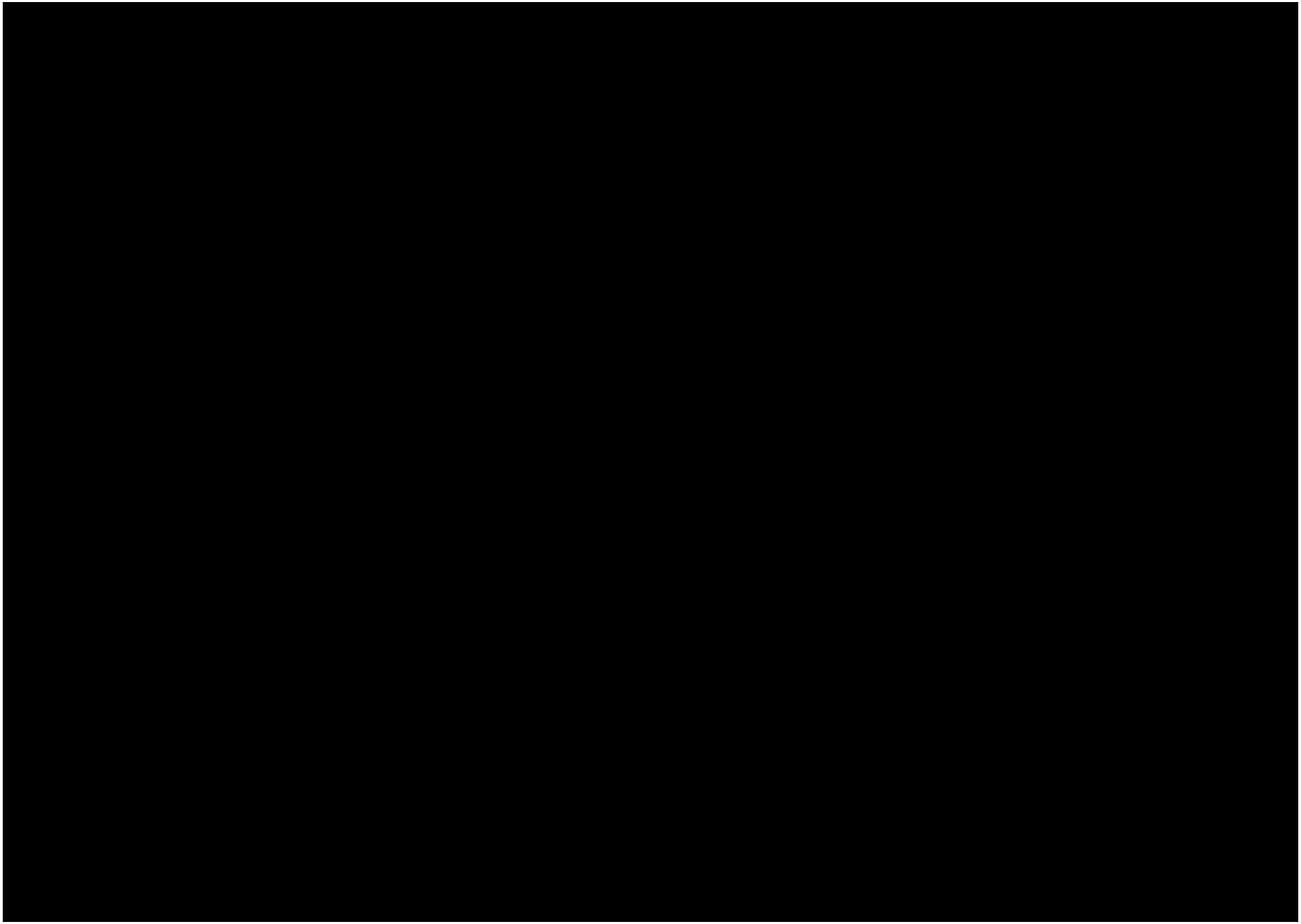


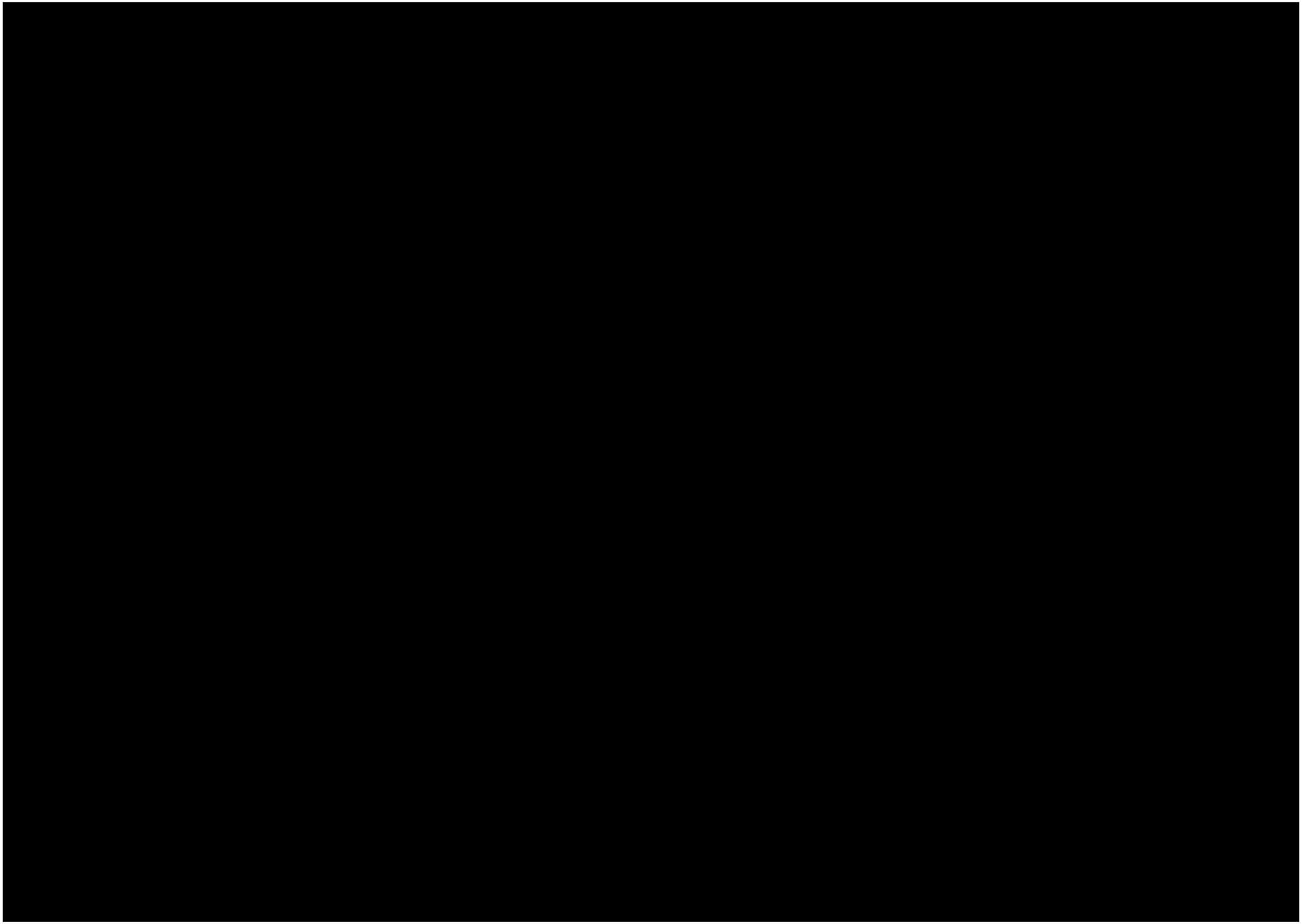


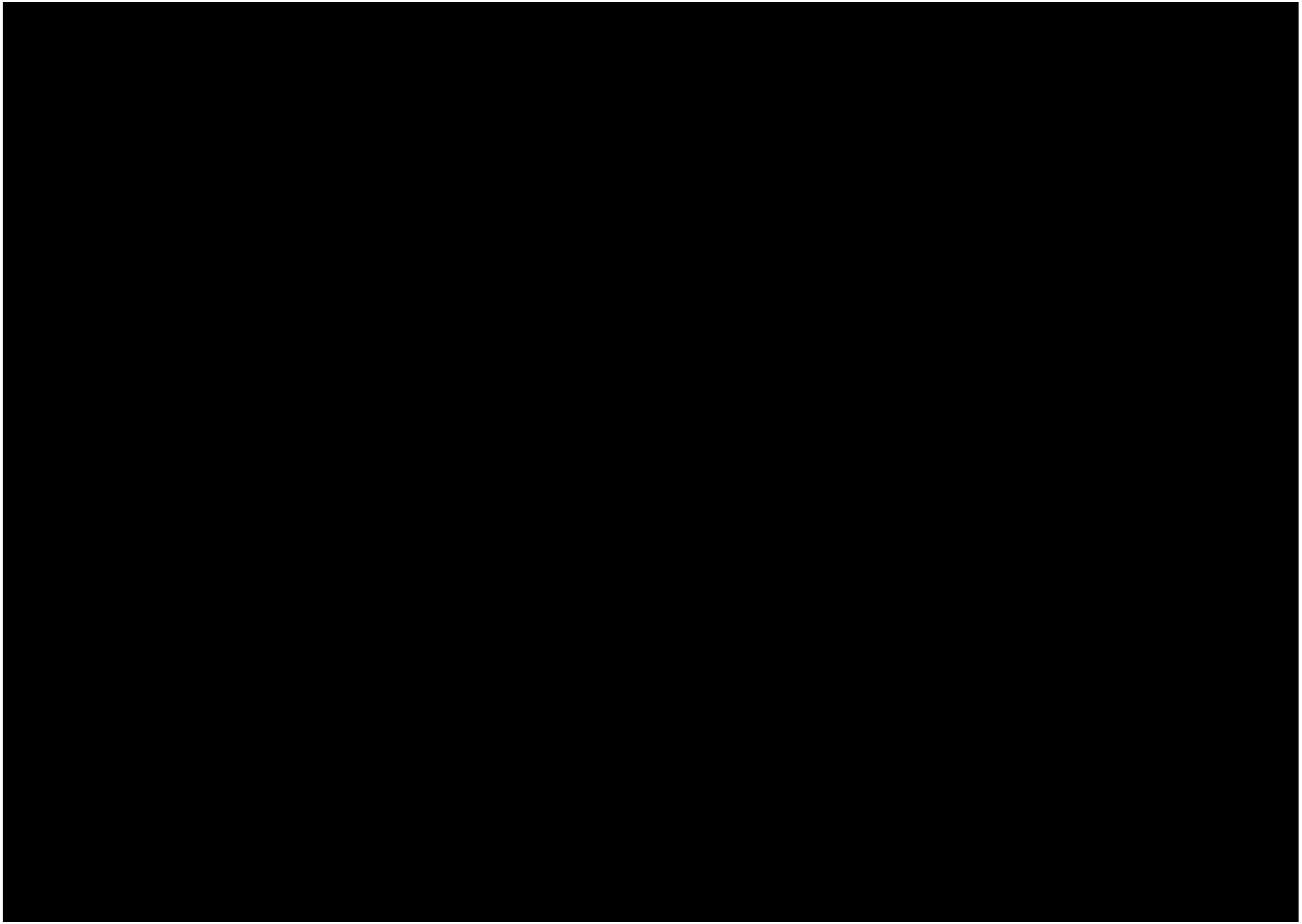


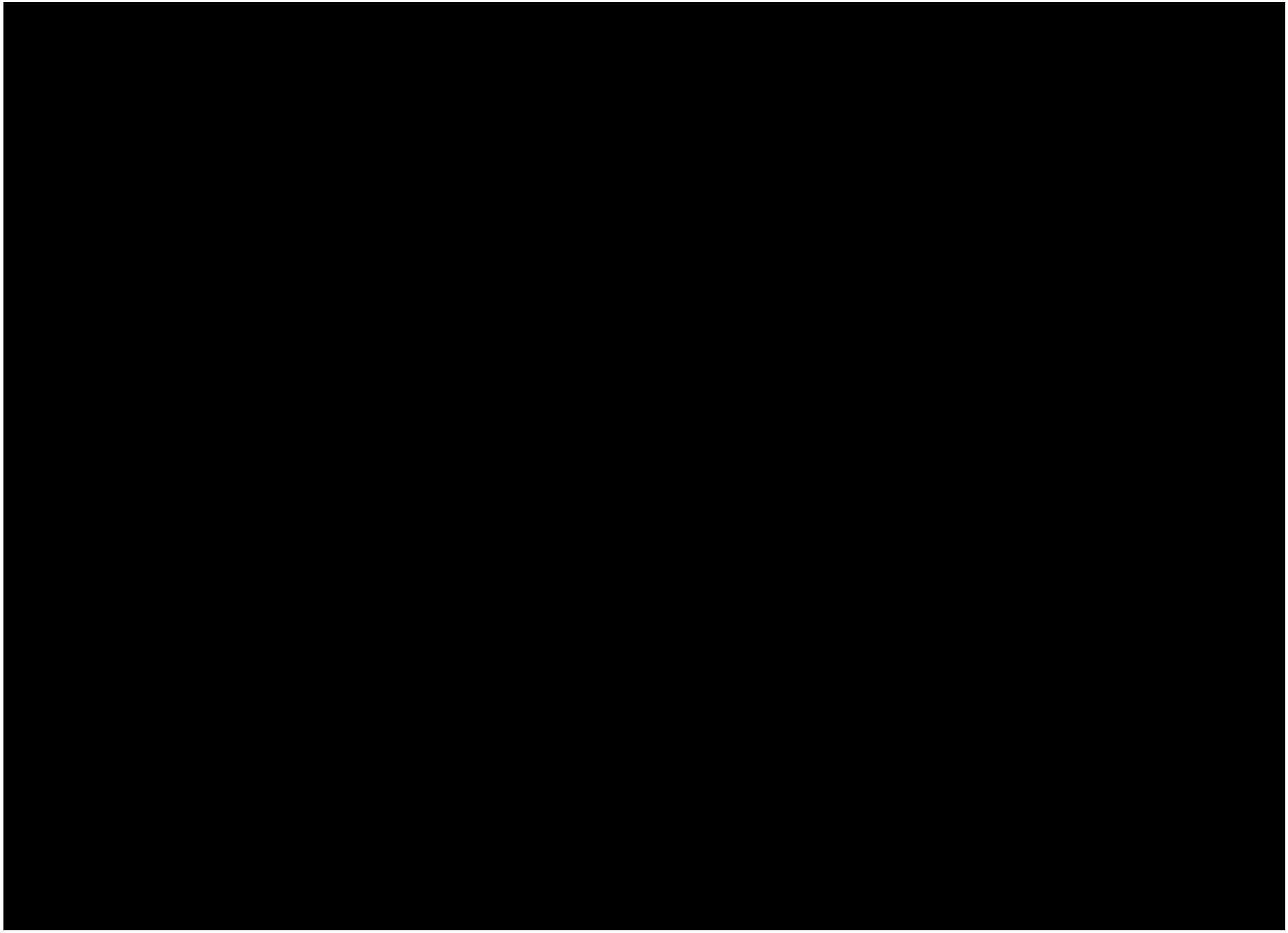


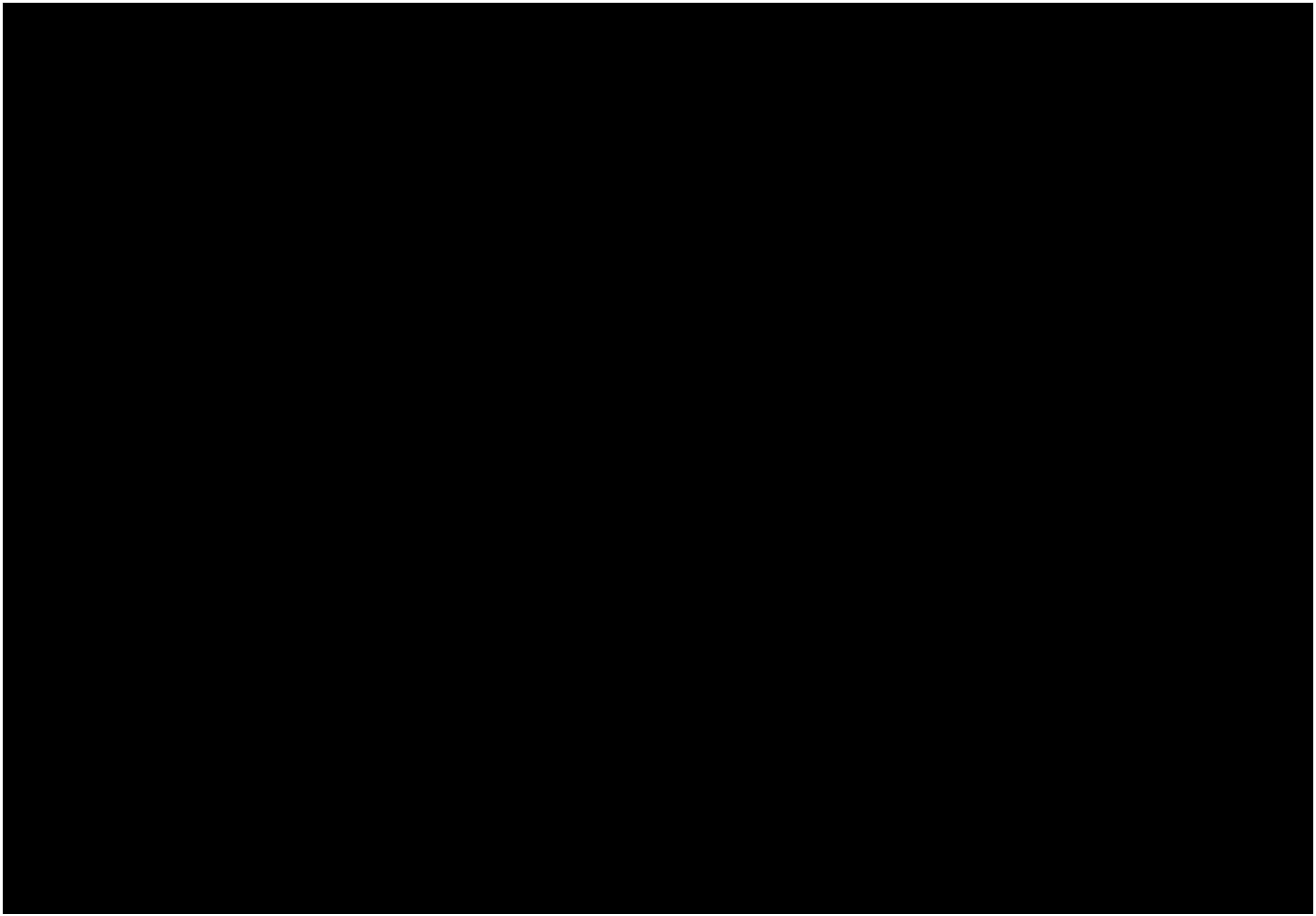


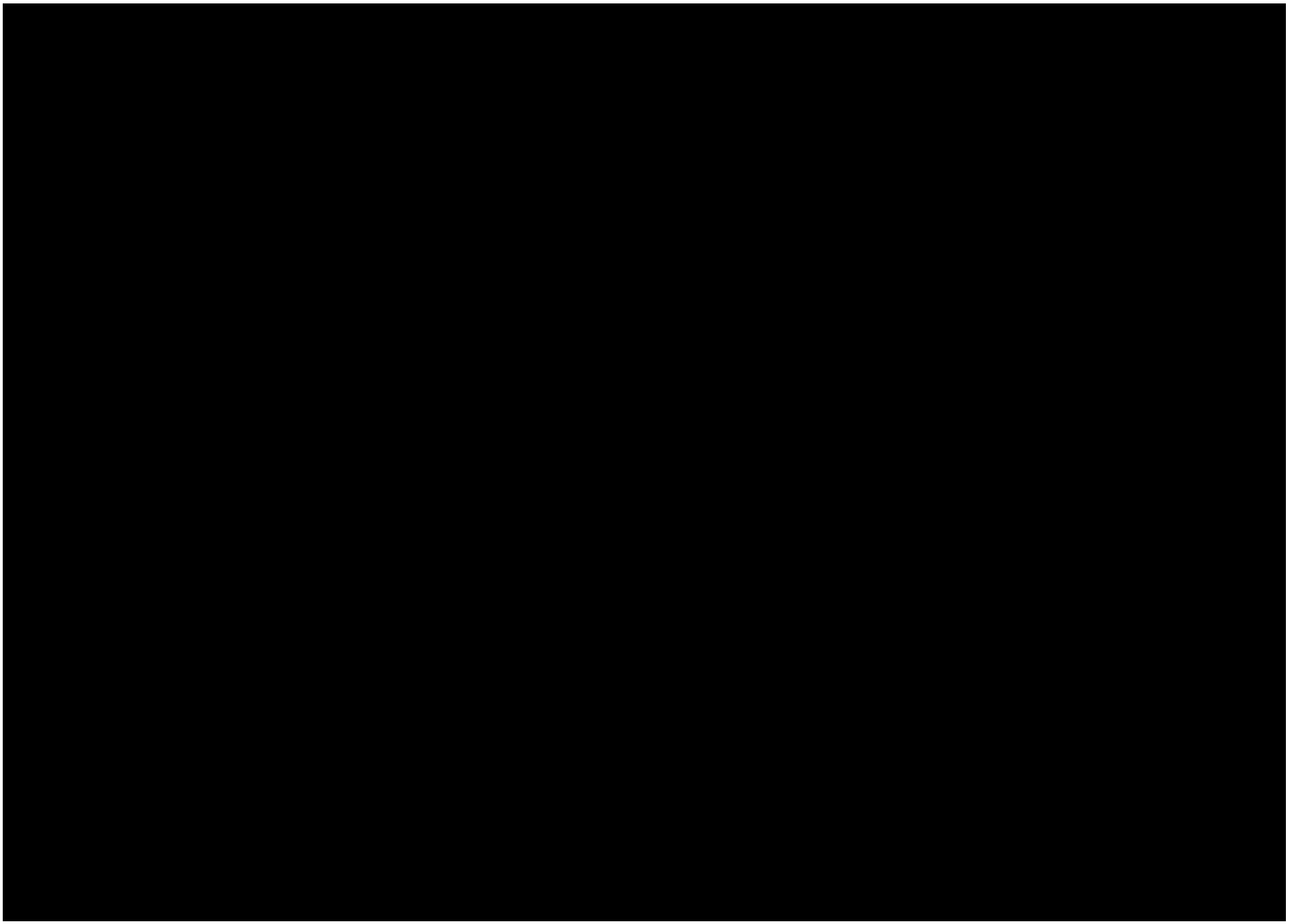


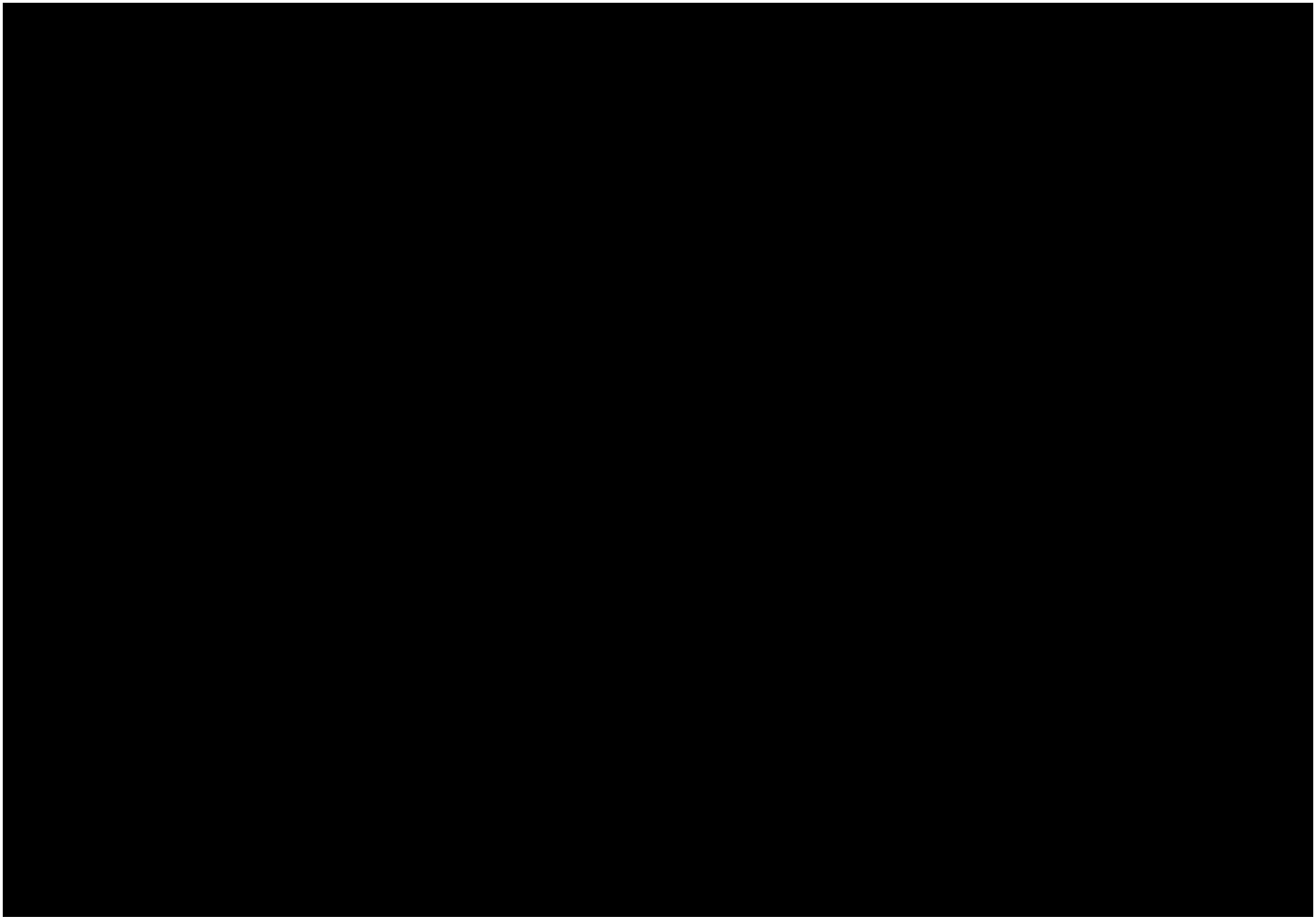












FLOOD REPORT - NO.9

Edgar Dam - Sunny Day Failure
13.3m at the Judbury Flood Gauge and Mean Sea Level
Peak discharge at Judbury: 5,680m^3/s
HUON RIVER from JUDBURY to WATERLOO (Huon Estuary), including TAHUNE

Maximum Flood Levels at Bridges	(m gauge)	(m AHD)
Tahune Bridge	17.2	62.0
Weld Rd Bridge	Not estimated	
Judbury Bridge	13.3	24.2
Huonville Bridge	8.9	7.5

Notes
~ The flood levels have been estimated using MIKE Flood software and are relative to the Australian Height Datum (m AHD).
~ Upstream of Judbury the MIKE Flood model is one-deimensional based on 1:25,000 topographic map contours.
~ Downstream of Judbury the MIKE Flood model is 2D with the floodplain based on LiDAR from Geoscience Australia and the river channel based on a variety of survey sources.

~ Coordinates are MGA (Map Grid of Australia), Zone 55.
~ For zones, refer to Appendix C of the FEP.

~ Emergency services should check maps (e.g. Street Atlas) for nearby properties that may be affected.
~ Buildings with floor levels greater than 1.0m above the predicted flood level are not included in this table.

Summary of flooded infrastructure

Bridges

	Roads	Easting	Northing	Estimated depth (m)	Comment
1	Channel Highway	504420	5235080	Greater than 1m	Significant length of Highway inundated between Huonville and Cradoc Hill Road
2	Wilmot Road near Mountain Creek bridge	503411	5237036	Greater than 1m	Inundated for full length.
3	Glen Huon Road, approx 1km from Huon Bridge	503012	5236139	Greater than 1m	Inundated at numerous locations along its length.
4	Huon Highway	502008	5236183	Greater than 1m	Significant length of Highway inundated between Huonville and Port Huon.
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	Bridges	Easting	Northing	Estimated depth (m)	Comment
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4	Huonville Bridge	503785	5235423	3.4	Bridge overtopped - likely to be washed away.

1. Tahune bridge deck level: 50.9 m AHD approx
2. Weld Road bridge deck level: 39.7 m AHD from SPM10617
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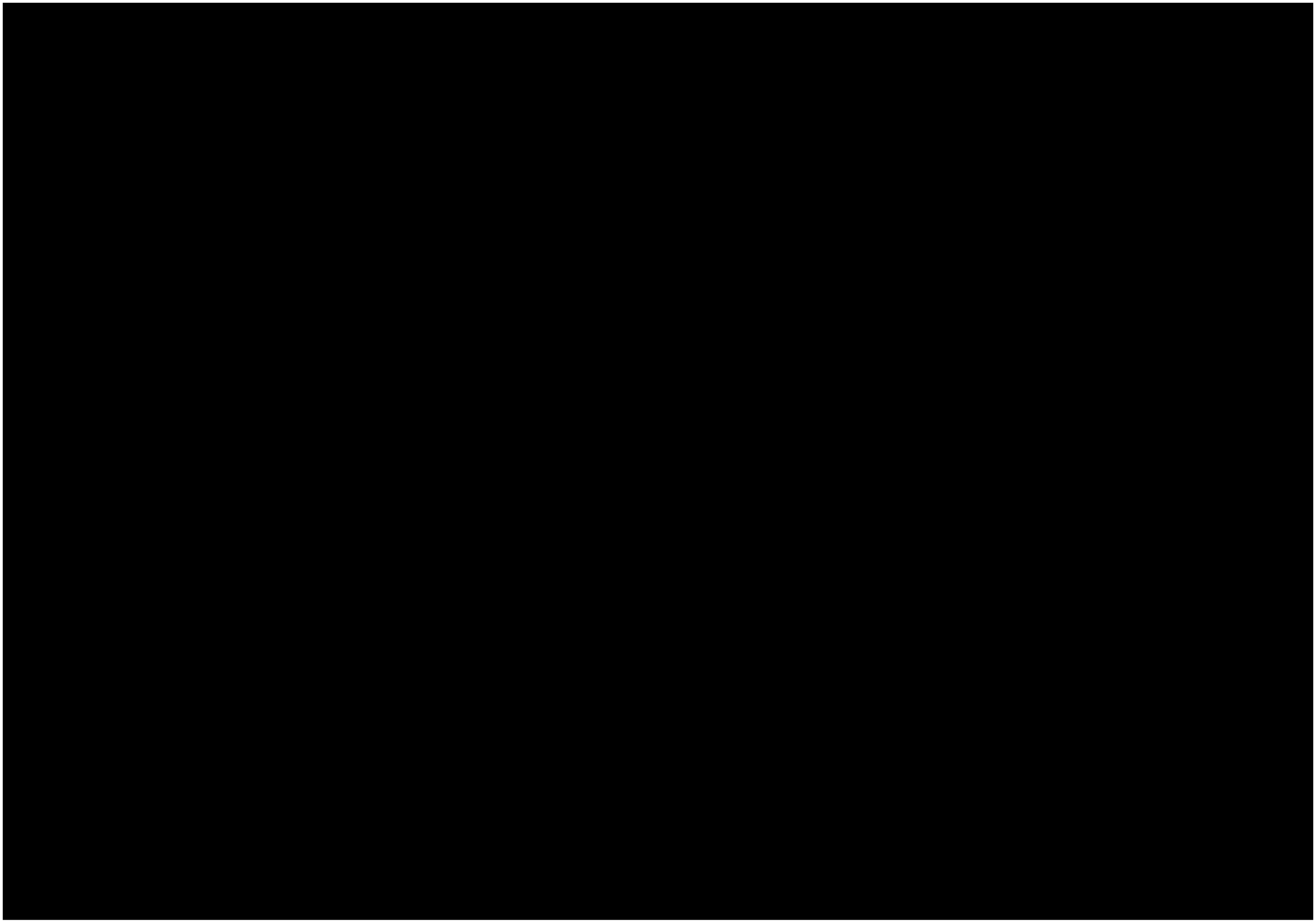
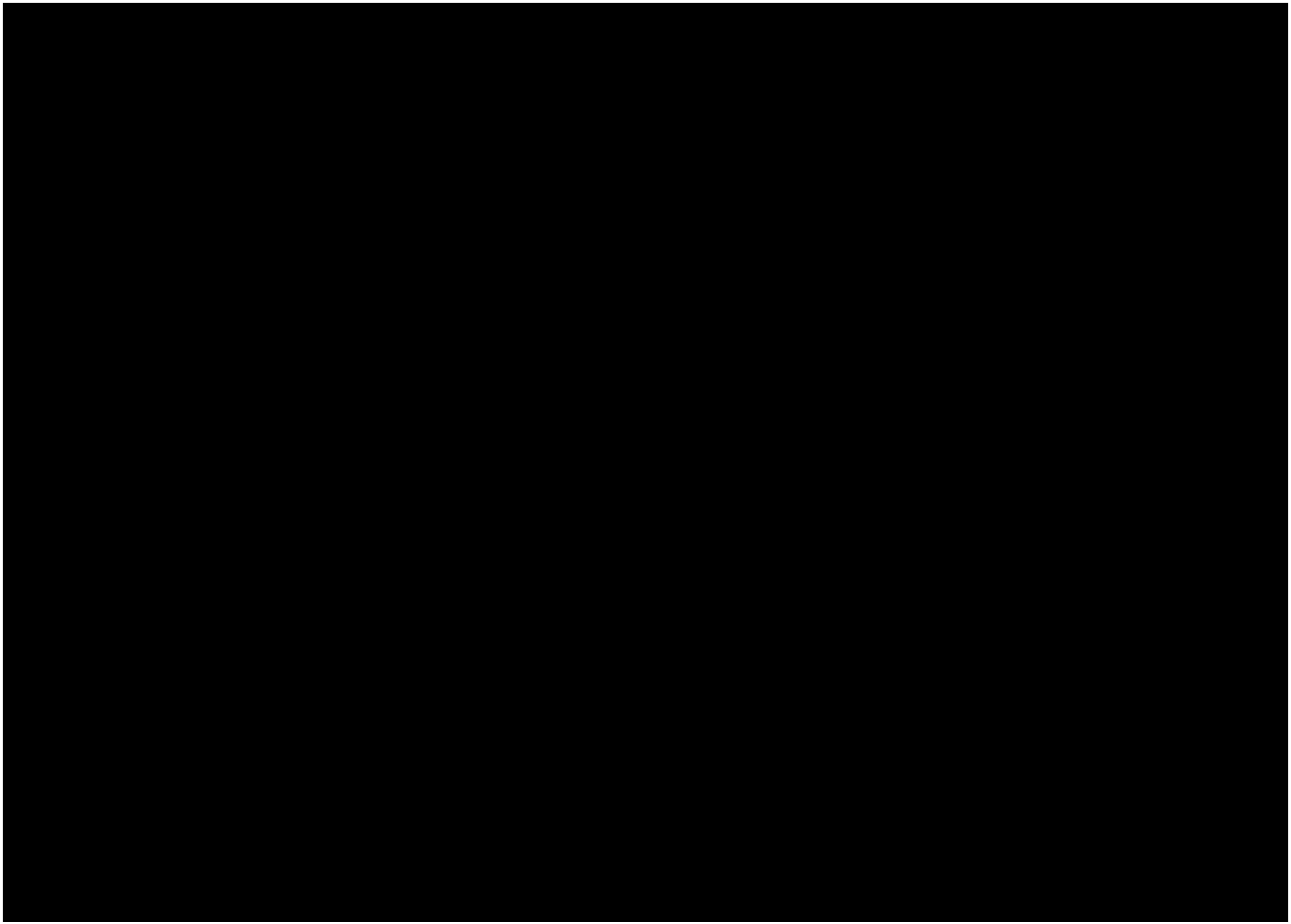
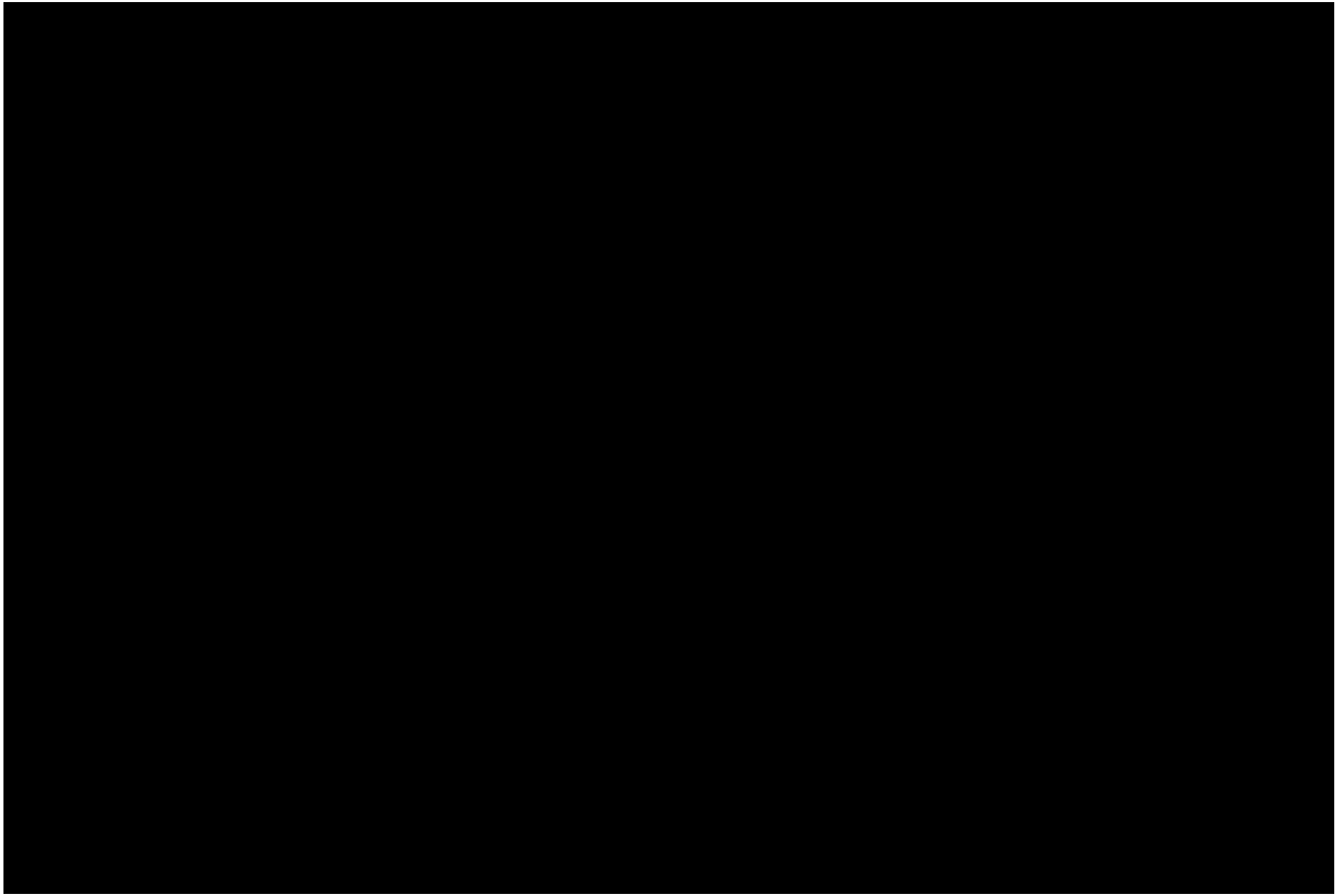
4. Huonville Bridge deck level: 4.12 m AHD, HTC Survet Station 680 (northern side of bridge at intersection with Channel Highway).

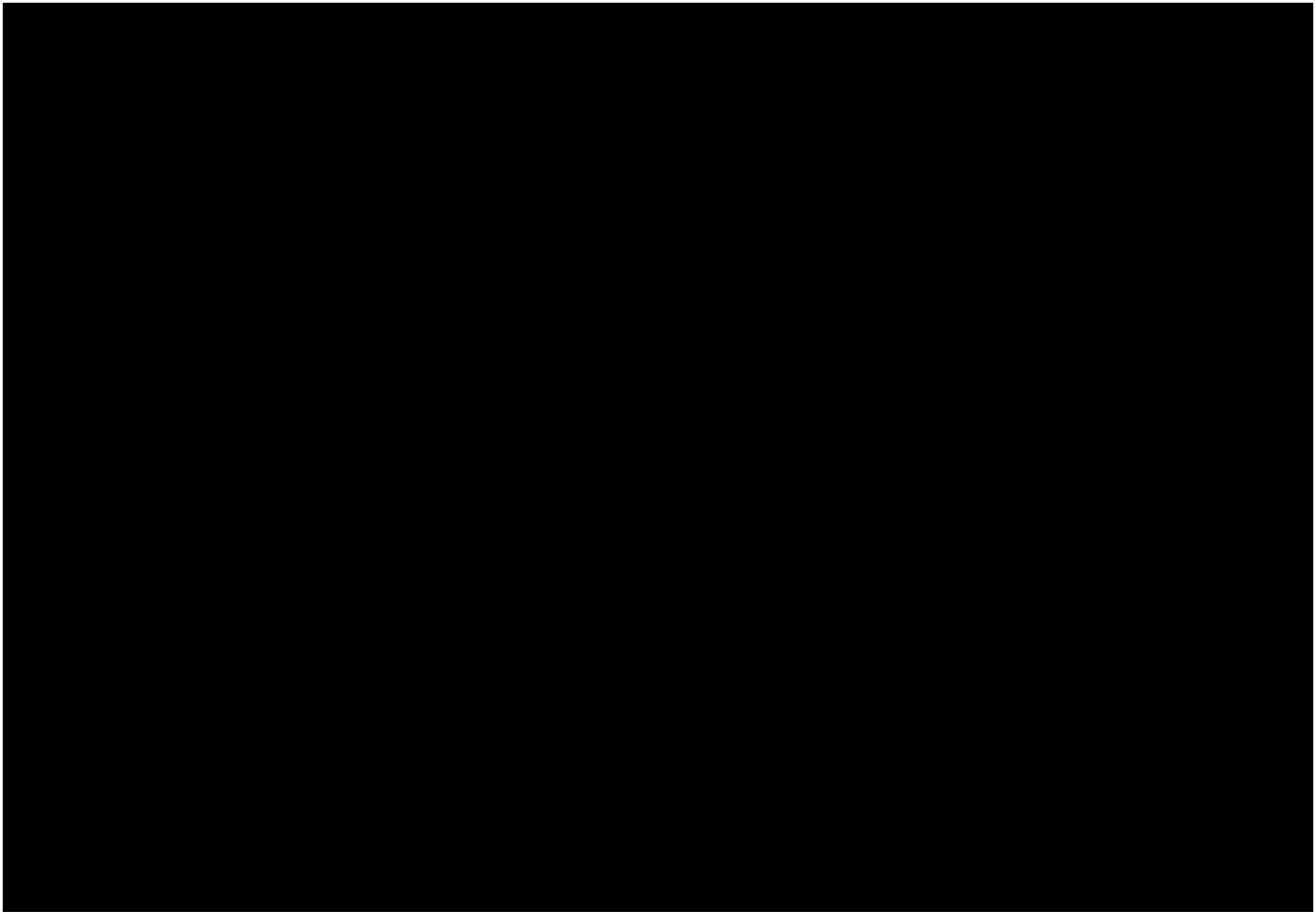
Summary of number of properties threatened

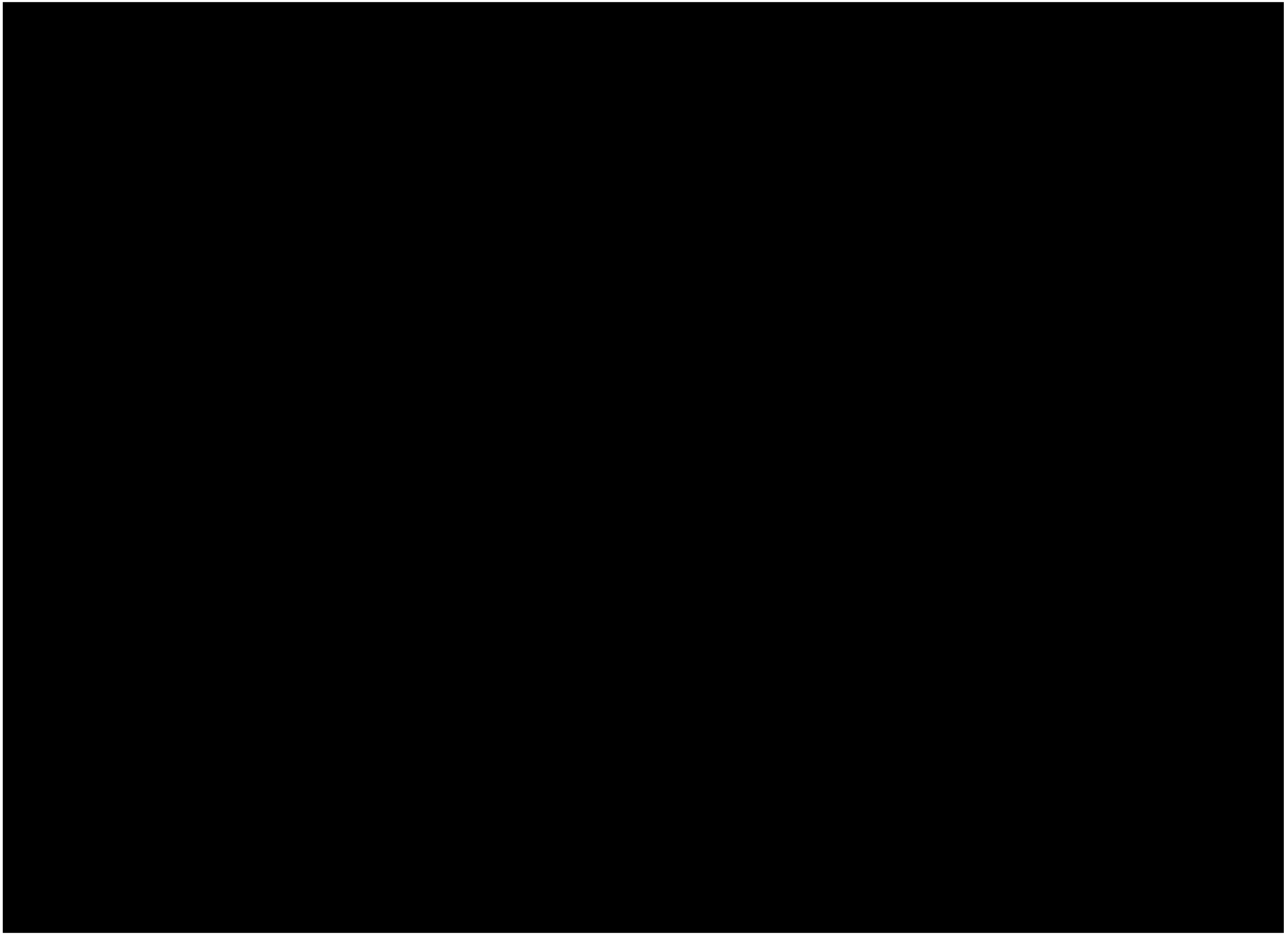
Zone	Area Name	No.
A	Judbury area including Tahune (north of Huon River)	8
B	Judbury-Glen Huon area (south of Huon River)	23
C	Ranelagh	2
D	Wilmot Street, Huonville (past school oval)	67
E	Main Street, Huonville (north of Shield Street)	19
F	Central Huonville	312
G	Flood Road area (eastern Huonville)	24
H	Franklin area, Huon Highway	75
I	Channel Highway	7
J	South of Castle Forbes Bay, Huon Highway	0
K	Cygnet Coast Road (southern section)	1
	Total	538

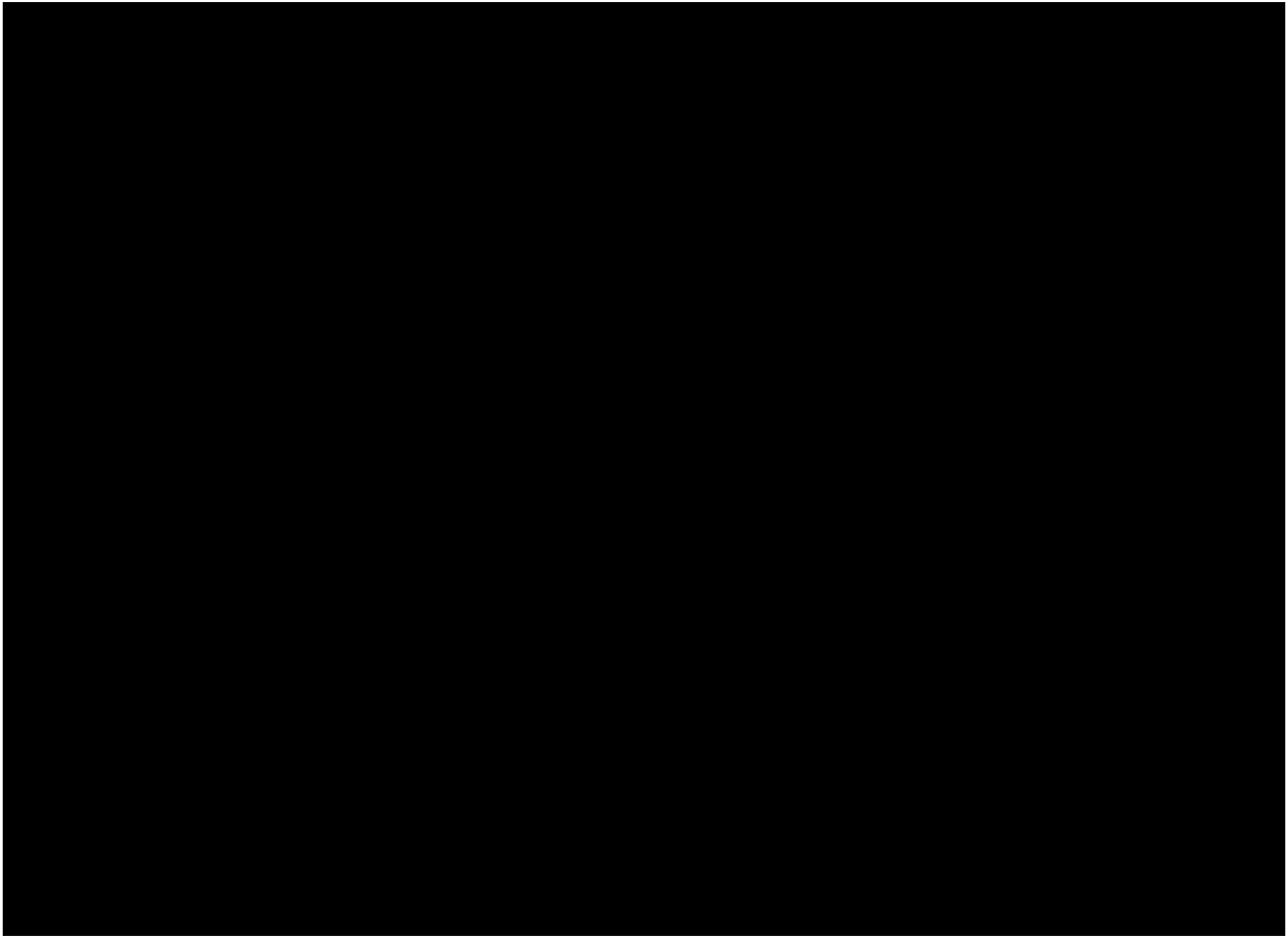


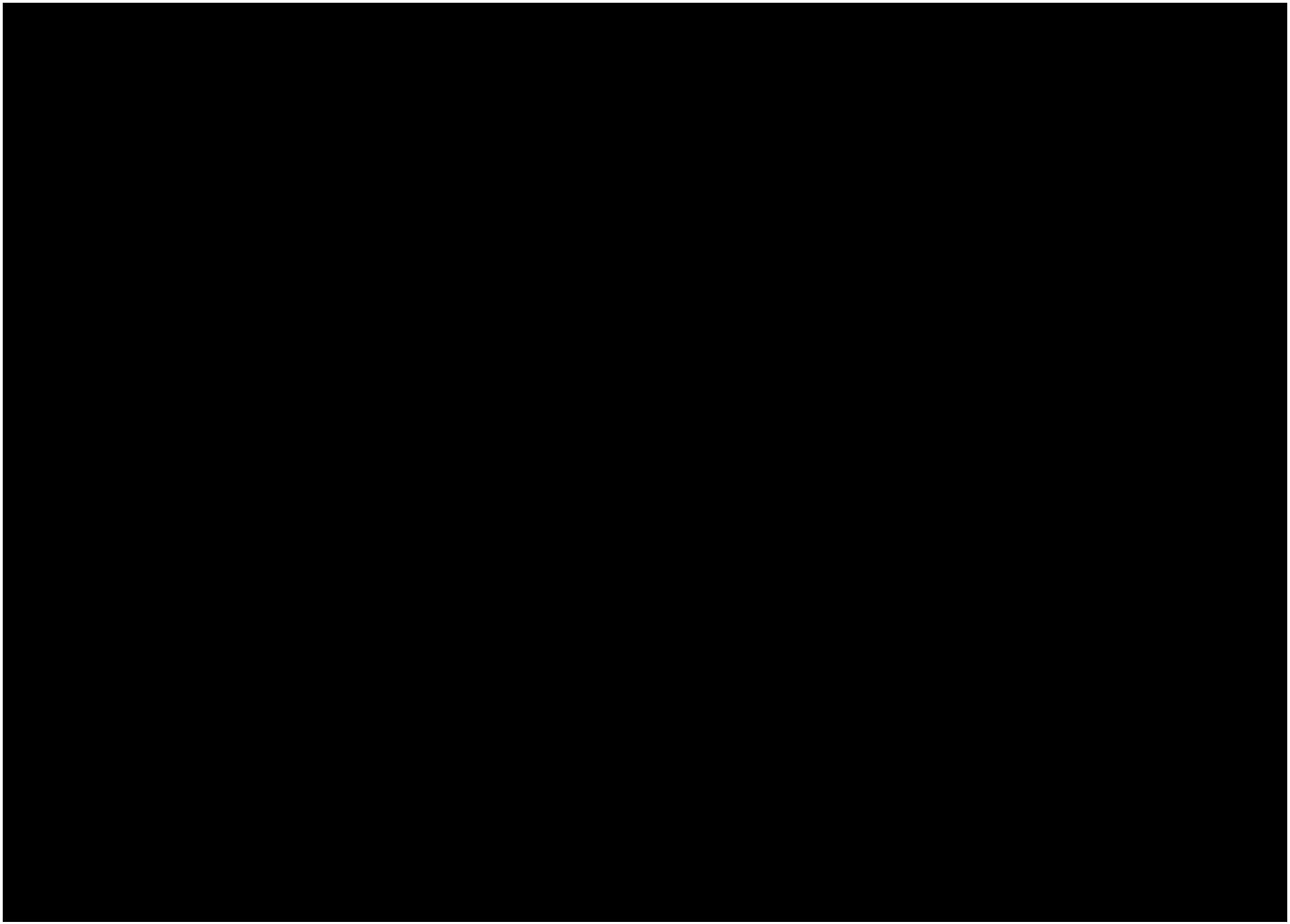


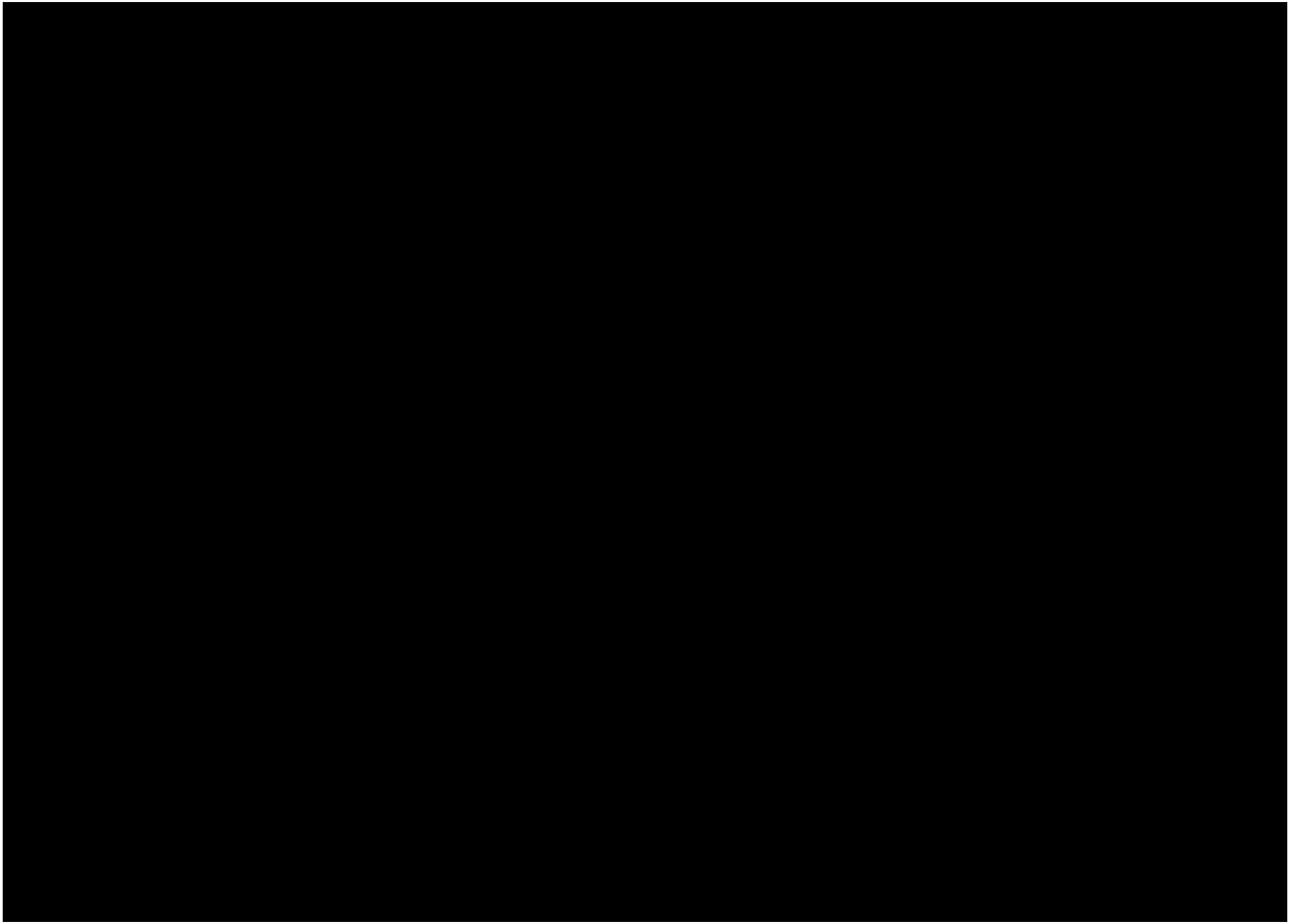


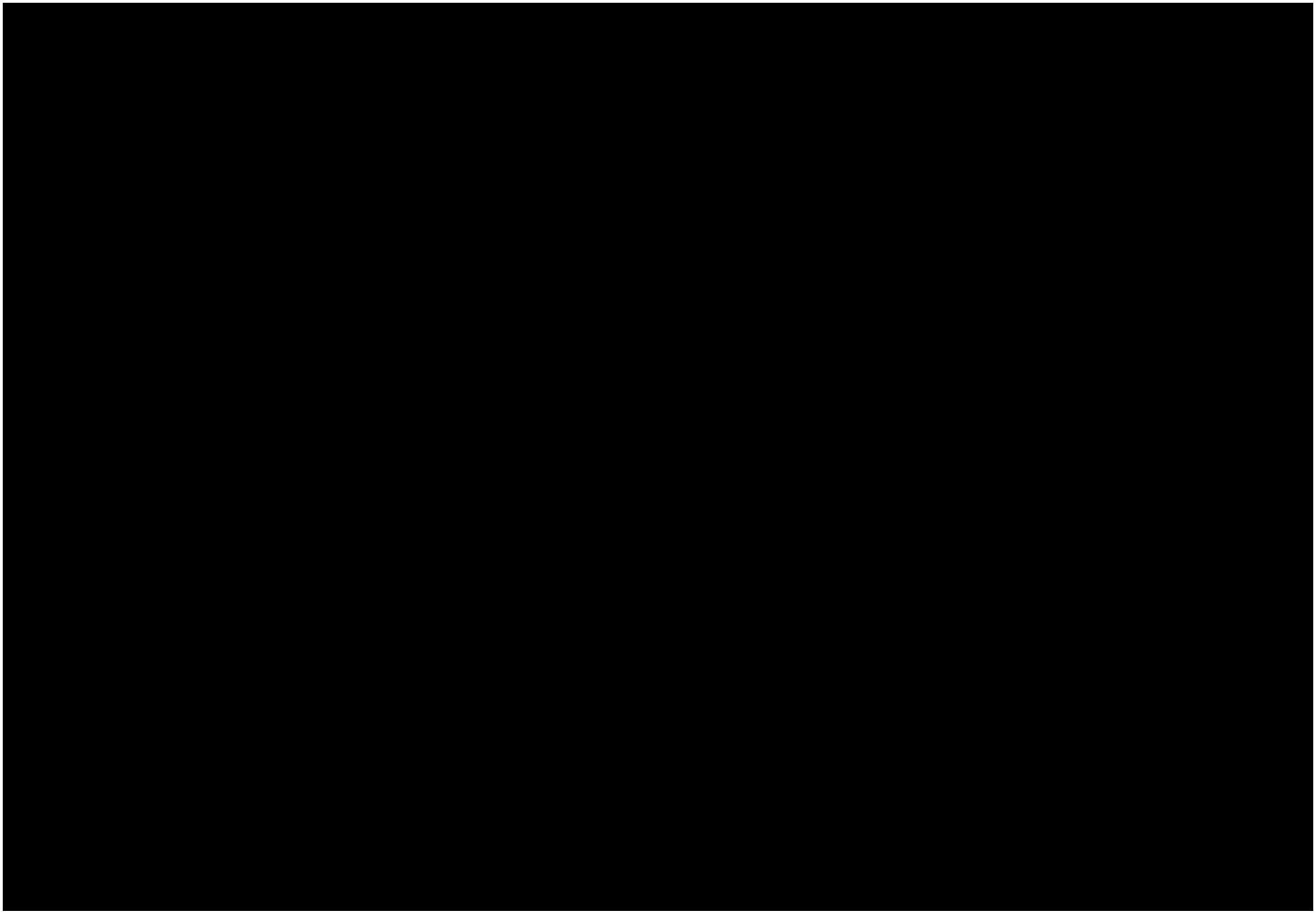


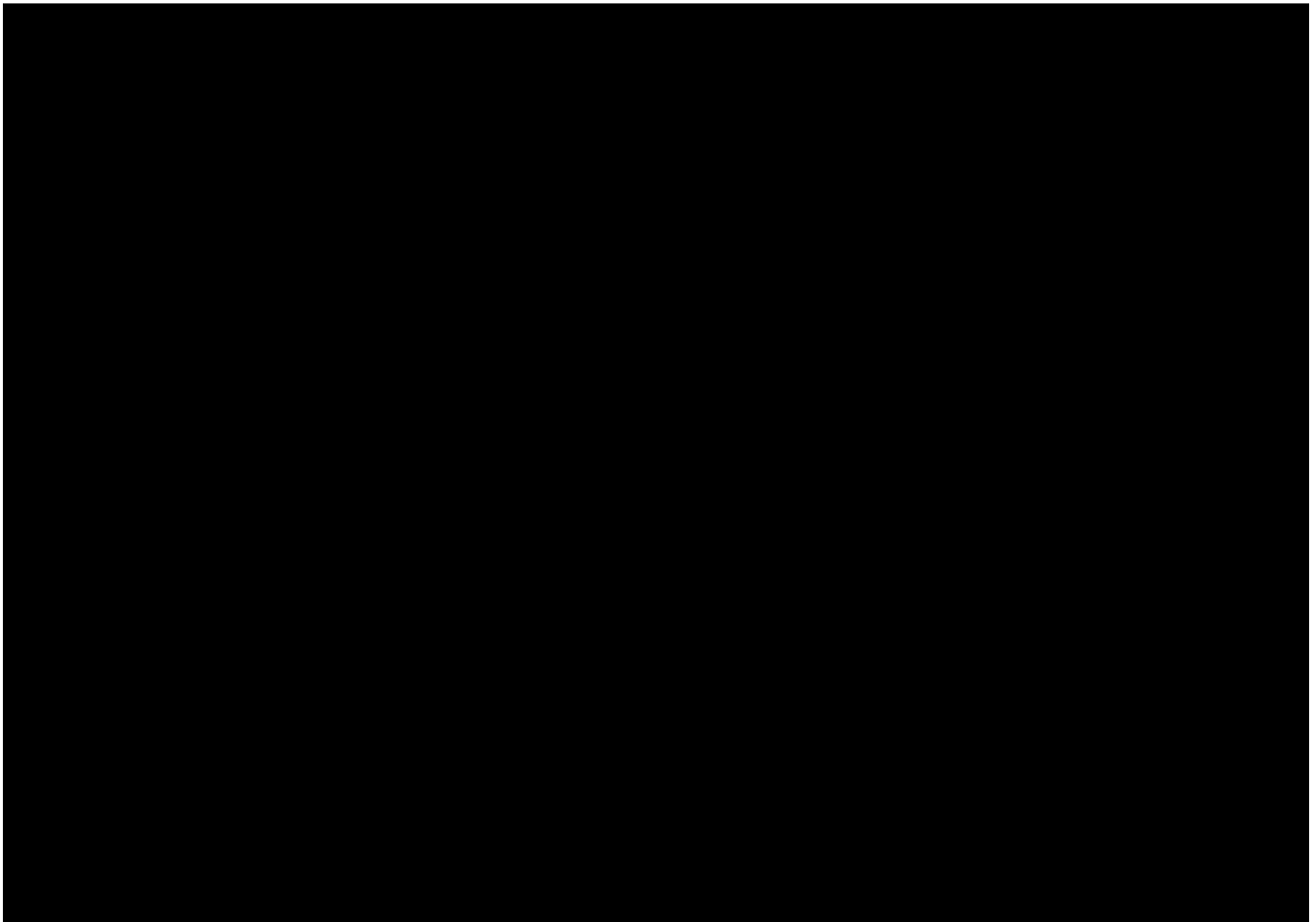


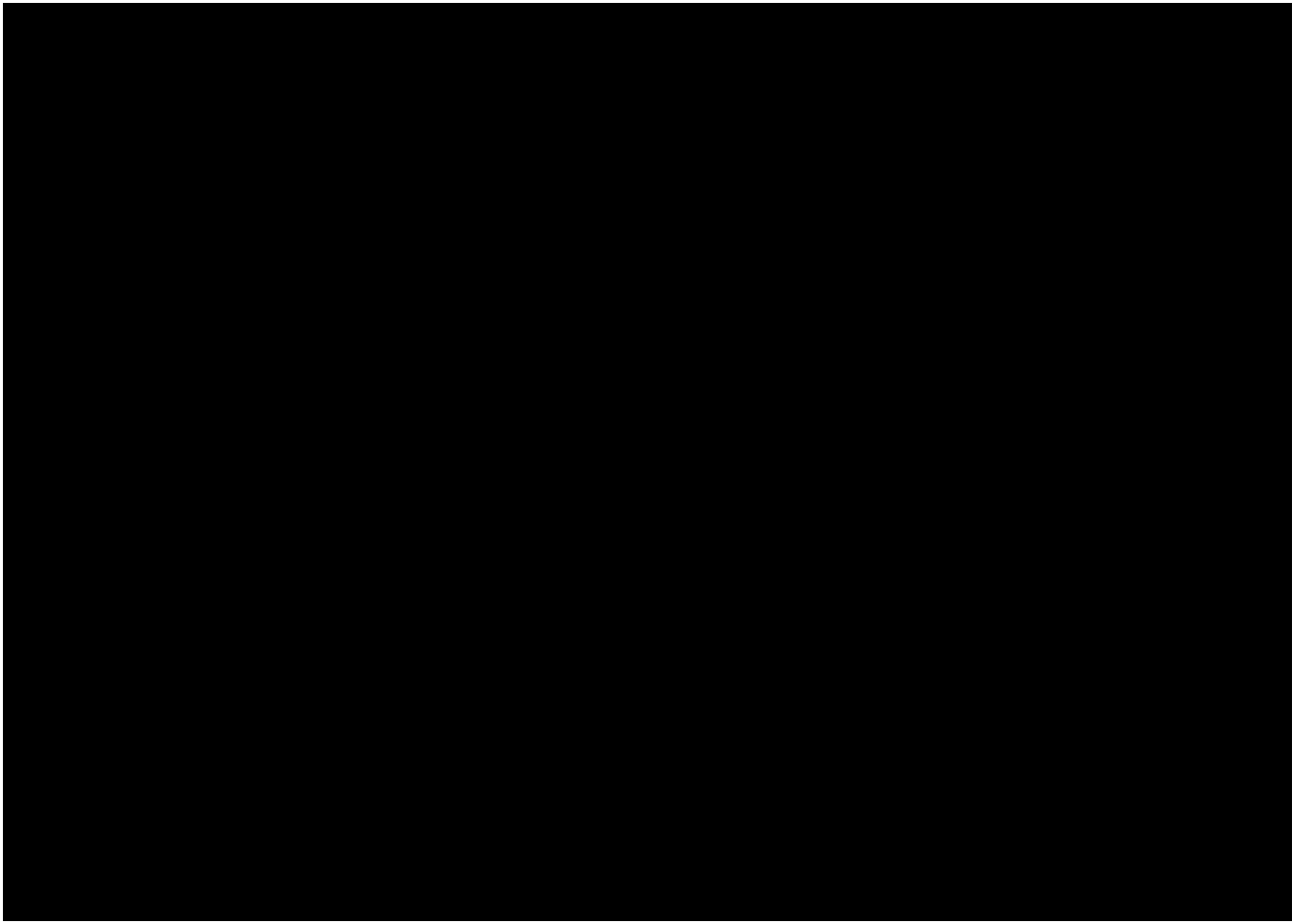


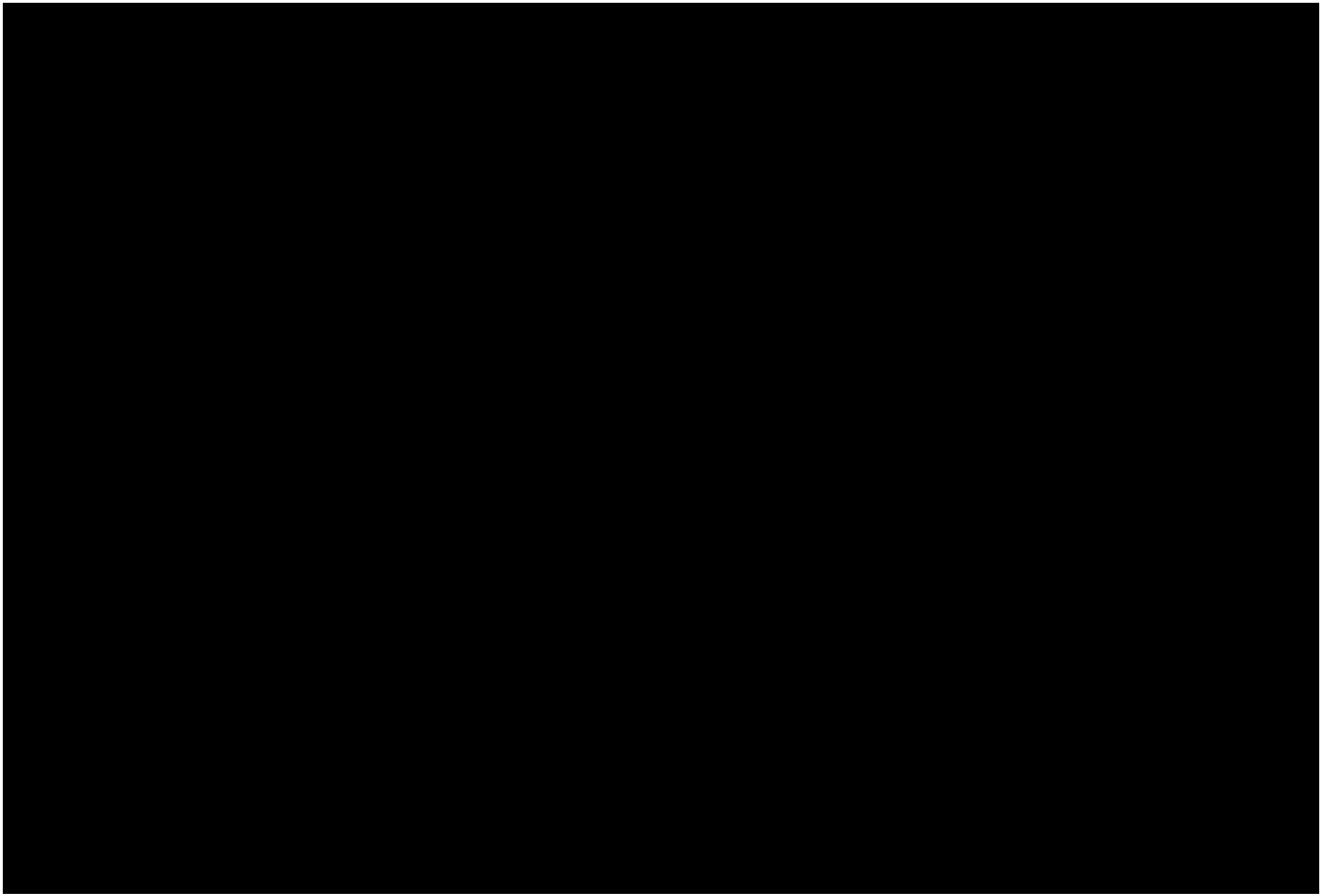












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F Background information

F.1 Historical information

Minor flooding is known to occur in Huonville on a regular basis. The main area affected is on the northern side of the Huon River and Wilmot Street. Severe floods occurred in 1901, 1947, 1958, 1960, and 1975, with the flood that occurred in April 1960 being the largest known flood event affecting Huonville. Significant floods in more recent times occurred in 1996, 2003 and August 2007. Local State Emergency Service representatives advise that there have been many evacuations in the Huonville area in recent memory.

It is understood that the February 1996 flood has been the largest event post 1992 based on advice from Huon Council.

A summary of major floods that have occurred in the Huon River in the last 100 years is provided in the Table F.1 below.

Table F.1: Major floods in the Huon River

Date of event	Flood details	
	Peak discharge (m^3/s)	Recorded at
2 October 2013	1,425	Judbury Gauge
27 September 2009	2,008	Judbury Gauge
10 August 2007	2,167	Judbury Gauge
25 August 2003	2,093	Judbury Gauge
6 December 2002	845	Judbury Gauge
10 February 1996	1,900**	Judbury Gauge
3 July 1990*	1,463	Frying Pan Creek
14 August 1980*	1,553	Frying Pan Creek
28 August 1975*	1,528	Frying Pan Creek
18 May 1975*	1,990	Frying Pan Creek
10 December 1968*	1,355	Frying Pan Creek
22 April 1960*	1,924	Frying Pan Creek
24 June 1952*	1,853	Frying Pan Creek
28 May 1948*	2,223	Frying Pan Creek
16 June 1947*	1,888	Judbury Gauge
17 May 1935*	1,829	Judbury Gauge
16 July 1921*	1,700	Judbury Gauge
1914*	1,990	Not known

* Sourced from (GHD, 1992)
** Judbury gauge not functioning. 1,900m^3/s estimated based on what is thought to be a post flood event survey of a high water level mark (6.45m gauge level) and using the latest Judbury rating curve to back calculate a flow.

In 2003 some businesses and homes were flooded and cars were towed out of flood waters. This flood was exacerbated by a high tide at its peak. Sandbagging of buildings was undertaken in Huonville, with a greater level of preparedness experienced than in 1996. Orchards at Rookwood, upstream of Huonville, were washed out. Road bridges at Grove, Cygnet and Dover were damaged. Water supplies in Huonville, Cygnet, Geeveston and Dover were contaminated4.

The August 2007 flood reached 4m at Huonville, the level at which the flood is classified as 'Major' (according to the Bureau of Meteorology; Figure F.1). This peak was reached in the mid-afternoon (around 3pm), although flooding at close to 4m was sustained for approximately 10 hours (from 8am to 6pm).

Figure F.1: Flood waters at northern end of Huonville Bridge at approximately 9:00am on the 12th of August 2007 (water level was nearing its peak of 4.0m)

The flood height at Judbury reached 6.3m and was 0.7m short of being classified as a Major flood. It was therefore classified as a 'Moderate' flood. The effect of the tide is thought to have resulted in the more severe flood conditions downstream at Huonville, compared to Judbury.

In 2009, a warning of minor flooding was issued for the Huon River, but both the levels peaked just below minor flood levels (http://www.bom.gov.au/tas/flood/flood_history/flood_history.shtml).

A detailed account of flooding along the Huon River prior to 1991 can be found in the GHD report *Huon River Flood Plain Study*[5].

F.2 Flood warnings and river gauges

BoM operates and maintains the Huon Valley Flood Warning System in partnership with the Huon Valley Council. The Huon Flood Warning system consists of a network of 12 rainfall and river height monitoring stations (HVC, 2014). Flood monitoring information is telemetered to the Hobart headquarters of the BoM, which uses this information to issue flood watches and flood warnings.

[4] Information from AustralianWeatherNews (www.australianweathernews.com/news /2003/030825.STM) that was sourced from the BoM and various news agencies.

[5] Department of Primary Industry Fisheries and Energy, Water Resources Division, Huon River Flood Plain Study – Stage 2 Report. GHD, June 1992.

The major flood gauges, relevant to Huonville flood evacuation planning, can be found at Judbury and Huonville (Figure F.2 and Figure F.3). Details of these gauges are provided in Table F.2 below.

Table F.2: Huon River flood warning stations

	Huon River at Judbury	**Huon River at Huonville**
Station number	094179	094180
Name	Huon Rv at Judbury (D)	Huon Rv at Huonville
Owner	DPIPWE	DPIPWE
Minor flood level (m gauge)	4.0	3.0
Moderate flood level (m gauge)	6.0	3.8
Major flood level (m gauge)	7.0	4.2

The gauge zero of the Judbury bridge flood gauge: is 10.89m AHD (Entura, 2016). The gauge zero of the Huonville flood gauge (Huonville Bridge – tidal board) is -1.438m AHD, which gives gauge levels 1.438 m higher than the gauges in the Huonville township area. The township gauges are relative to the Australian Height Datum (AHD).

The town gauges can be used as a visual indicator of flood level rise during the flood event, but should not be compared directly with BoM forecast or present levels. The SES will monitor these gauges during the flood event.

Figure F.2: Judbury flood gauge located on the right bank (looking downstream) on the downstream abutment (0m at the gauge = 10.91m AHD)

Figure F.3: Huonville flood gauge located on the left bank (looking downstream) on the downstream abutment (0m at the gauge = -1.438m AHD)

F.3 Judbury gauge site rating curve

The rating curve at the Judbury gauge site is used to transform recorded water levels into estimates of river discharge (m^3/s).

The Judbury rating curve has changed over time as additional flow measurements have been obtained and as the gauge site has been maintained and upgraded.

Figure F.4 shows the current rating curve (blue line), past rating curves and the calibration of the XP SWMM model for the August 2007 flood event (refer to Appendix G).

It should be noted that the datum of the Judbury gauge site is +10.89m AHD.

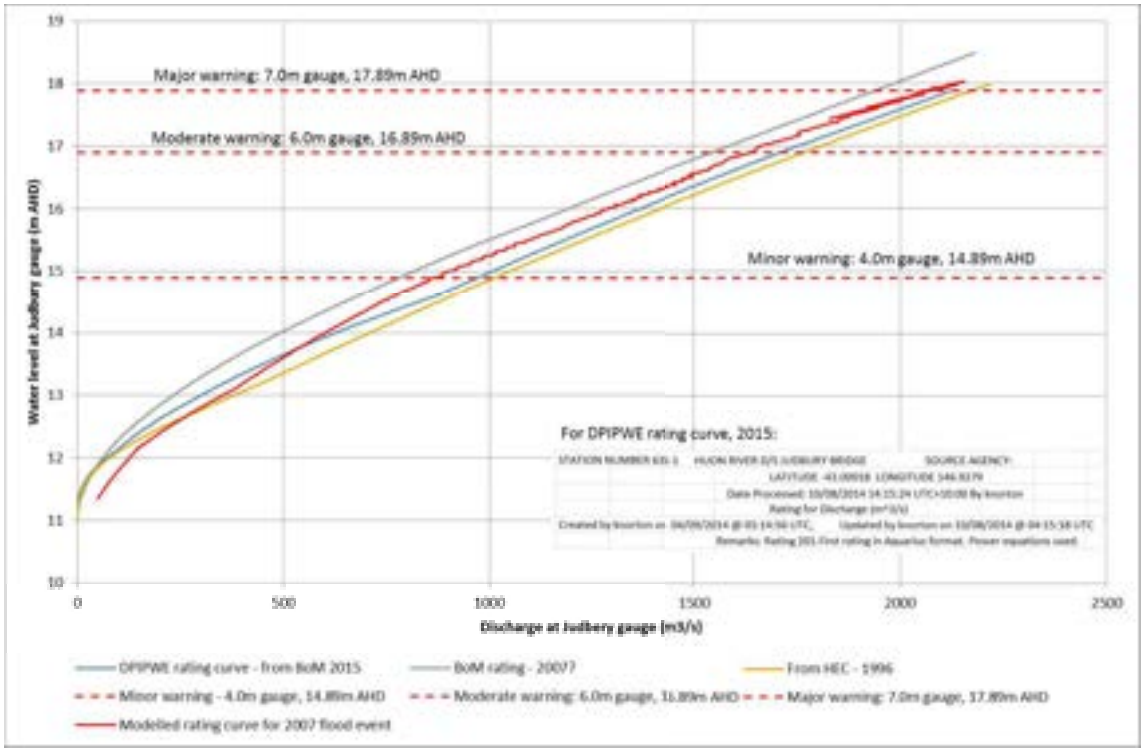

Figure F.4: August 2007 flood event – Rating curve comparison at Judbury

G Huon River flood modelling

G.1 Introduction

A number of hydraulic studies have been carried out for the Huon River since 1991. The latest modelling was carried out by Entura for the joint purpose of this FEP and also for the Floodplain Risk Assessment Process for Tasmania (FRAPT) which aimed to assess the latest national guidelines for flooding and flood risk assessment.

The flood inundation maps and flood tables in this FEP are based on three separate modelling studies as outlined below:

- 6m, 7m and 8m flood at Judbury gauge: XPSWMM flood modelling carried out in 2016.
- Scotts Peak Dam, dam crest flood and dambreak scenario: MIKE 21 modelling carried out by Entura for the 2007 FEP.
- Remaining dambreak scenarios: MIKE21 modelling carried out by Entura for Hydro Tasmania in 2014/2015.

The latest modelling carried out by Entura in 2016 is considered to be the most accurate as both the hydrologic and hydraulic models were calibrated to past flood events. The previous hydraulic modelling carried out by Entura was not calibrated and detailed hydrologic studies were not carried out.

G.2 Dambreak modelling

The dambreak modelling (2007 FEP and 2014/2015 Hydro Tasmania dambreak modelling) was carried out using combined 1D/2D hydraulic models using the MIKE 11 and MIKE 21 software packages.

The 2007 FEP study included the following dambreak scenarios:

- Sunny Day Failure (SDF) of Scotts Peak Dam.
- Dam crest flood (DCF) and failure of Scotts Peak Dam.

The 2014 dambreak modelling carried out by Entura was focussed on providing a more comprehensive assessment of SDF scenarios and included:

- Scotts Peak Dam SDF.
- Simultaneous SDF of Edgar Dam and Scotts Peak Dam.
- SDF of Edgar Dam followed by Scotts Peak Dam.
- Scotts Peak East Saddle Dam SDF.
- Edgar Dam SDF.

The 2007 MIKE11/MIKE 21 model was updated using available LiDAR survey to assess the new SDF scenarios, however the model was not calibrated.

There has been no change to the 2007 DCF and failure of Scotts Peak Dam scenario.

Details of the 2007 MIKE 11/MIKE 21 hydraulic models can be found in the 2007 FEP document.

Details of the 2014 updated MIKE11/MIKE 21 model can be found in *Scotts Peak Dam and Edgar Dam Earthquake Loading Failure Consequence Assessment*, ENTURA-7F26A, 11 June 2014 .

G.3 Natural flooding - updated modelling for FRAPT and FEP

As part of these two projects detailed hydrologic (RORB) and hydraulic (XPSWMM) models were developed for the Huon River catchment and river respectively. A flood frequency analysis at the Judbury gauge site on the Huon River was also completed to assist in calibration of the hydrologic model and to determine the annual exceedance probabilities (AEPs) for peak flood discharges in the Huon River.

Full details of the flood frequency analysis and the RORB and XP SWMM models can be found in the *Floodplain Risk Assessment Process for Tasmania: Huonville Case Study Flood Study Report* (Entura, 2016). Copies of this document are held by the Huon Valley Council and the State Emergency Service.

A summary of the modelling is summarized below.

G.3.1 Flood frequency analysis

The results from the flood frequency analysis at the Judbury gauge is shown in Table G.1.

Table G.1: Flood frequency results – Huon River at Judbury gauge

Flood AEP	Peak flow estimate (m^3/s)	90% Confidence Interval (m^3/s)	
		95% Limit	5% Limit
20%	1,850	1,680	2,015
10%	2,080	1,870	2,290
5%	2,275	2,025	2,525
2%	2,565	2,255	2,880
1%	2,780	2,420	3,140
0.5%	2,990	2,600	3,400

G.3.2 Vertical datums

The study modelling has been completed in m AHD however flood level results are presented in both m AHD and the local datums at the BoM's Judbury and Huonville gauge sites.

Judbury gauge: 0m = +10.91m AHD (Surveyed January 2014)

Huonville gauge: 0m = -1.438m AHD (Surveyed January 2014)

G.3.3 Hydrologic and hydraulic models

A RORB hydrologic model was developed for the Huon River catchment and calibrated to five past flood events and a flood frequency analysis of data at the Judbury gauge site. The calibrated RORB model was then used to develop the design flood hydrographs for the hydraulic model. The catchment layout of the RORB model is provided in Figure G.1 and a schematic of the model layout is provided in Figure G.2.

An XP SWMM combined 1D/2D hydraulic model of the Huon River was developed for the study. The 1D cross sections representing the river channel were based on a range of survey data sources and the 2D floodplain was based on available LiDAR from Geoscience Australia. Figure G.4 shows the sources of data used to model the river channel downstream of Ranelagh while Figure G.3 shows the extent of the XPSWMM model.

The hydraulic model extends from just upstream of the Manuka Road bridge over the Huon River at the Tahune Airwalk to approximately Port Huon. Initially the model extent to Eggs and Bacon Bay, however it was found that flood flows did not influence water levels downstream of Port Huon due to the size of the river channel. The XP SWMM model includes the Manuka Road, Judbury and Huonville bridges as hydraulic structures. The Weld Road bridge was not included as there was no survey available.

The XP SWMM model was developed to focus on flooding from the Huon River only. Smaller tributaries in the vicinity of Huonville (Mountain River, Huonville Main Drain and Skinners Creek) are included to some extent in the model which is considered suitable to assess flooding effects from the Huon River. However the resolution is not adequate to accurately assess flooding effects from flows within these tributaries. The XP SWMM model can however be relatively easily updated to include these tributaries to assess localised flooding in the future.

The XP SWMM model was calibrated to the August 2007 flood event with an acceptable match achieved to the recorded peak flood level at the BoM's Huon bridge gauge site and flood extent.

Details of the RORB and XP SWMM model build can be found in the *Floodplain Risk Assessment Process for Tasmania: Huonville Case Study Flood Study Report* (Entura, 2016). Copies of this document are held by the Huon Valley Council and the State Emergency Service.

Figure G.1: RORB model catchment layout

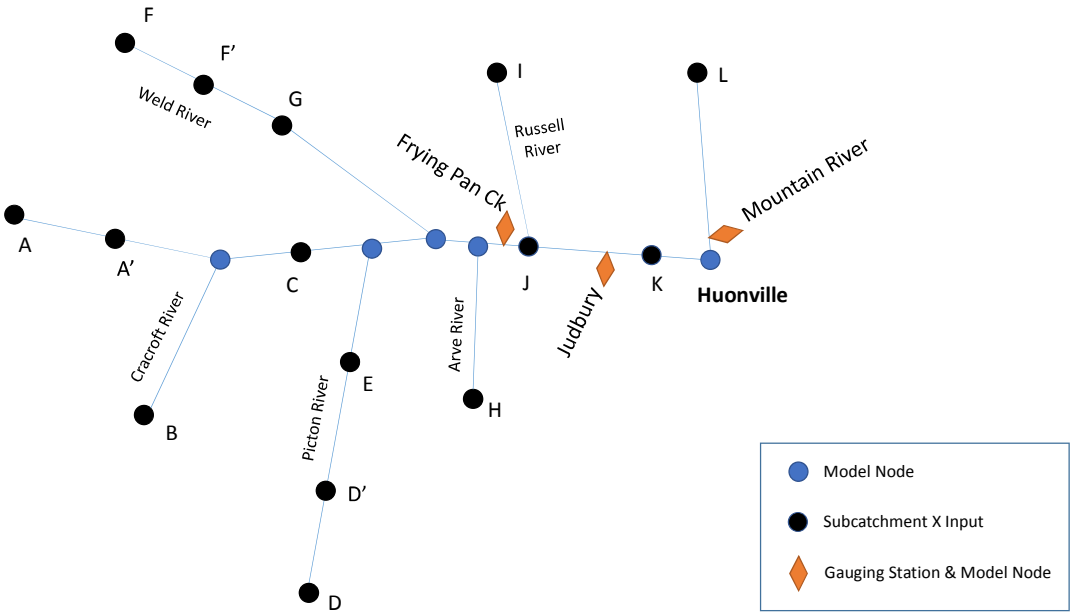

Figure G.2: RORB model schematic

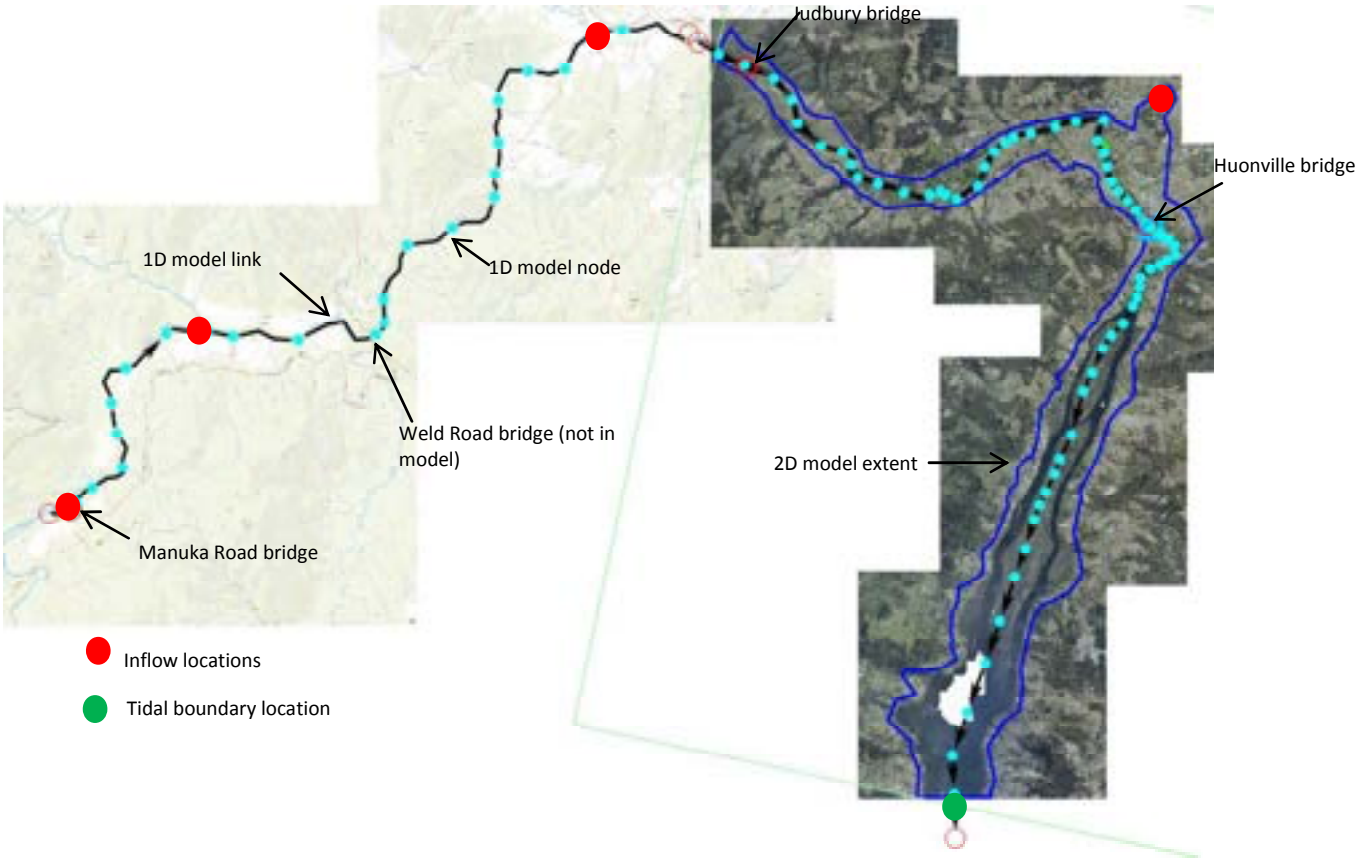

Figure G.3: XP SWMM model extent

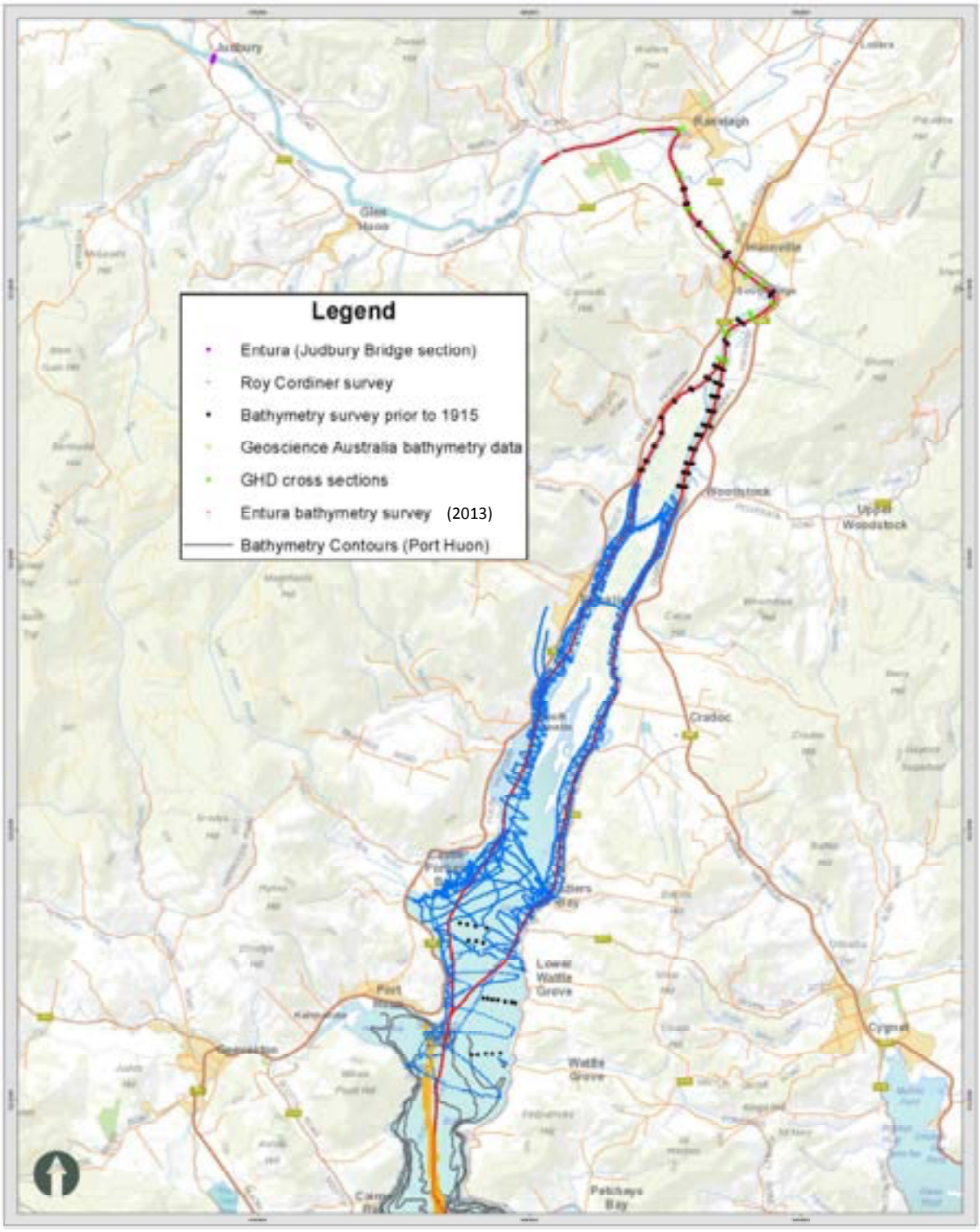

Figure G.4: River channel survey

G.3.4 Flood scenarios

The flood modelling for this FEP was carried out for five flood scenarios based on flood levels at Judbury flood gauge and tidal levels at Port Huon. The scenarios assessed three different flood events and three different tidal influences. The flood scenarios, including their design peak discharge at Judbury flood gauge, tidal levels and design flood frequency are included in Table G.2 below. The flood scenarios were discussed and agreed to with HVC and the SES.

It should be noted that in the previous FEP (Entura, 2007) the flood scenarios were based on 6.6m, 7.6m, 8.6m, 10.0m and 12.0m peak water levels at the Judbury gauge site. The changes for this FEP were made to be consistent with the current BoM flood warning levels and the HVC Standard Operating Procedures for flooding.

Table G.2: Modelled scenarios

Peak level at Judbury flood gauge (m)	BoM warning level	Tide level at Port Huon	Peak discharge at Judbury flood gauge (m^3/s)	Design flood frequency Annual Exceedance Probability (AEP)
6	Moderate	MSL	1736	approximately 25%
7	Major	LAT	2152	approximately 6.7%
7	Major	MSL	2152	approximately 6.7%
7	Major	HAT	2152	approximately 6.7%
8	Major +	MSL	2675	approximately 1.25

G.4 Plotting flood extents using GIS

The two-dimensional modelling in the Huonville area produced ASCII grids which can be converted and plotted in the GIS. This form of modelling gives inundation depths and water surface levels. The inundation extent line is formed where the inundation depth equals zero.

The one-dimensional modelling produces flood height estimates at each cross section location for each of the flood events. Straight line interpolation between each cross section was performed, with the flood extent formed from the intersection of the modelled terrain and the interpolated water surface. The intersecting line was created and smoothed using tools within the ArcView GIS program This method was used for mapping at Tahune Airwalk area.

G.5 Calculating inundation depths of buildings using GIS

The inundation depths of buildings were estimated by comparing the building floor level (either surveyed or inferred from LiDAR survey) with the calculated flood level as shown in Figure G.5. To take into account of potential inaccuracies in mapping the predicted flood extent the potential for buildings to be inundated was assessed for those that fell within the inundation zone and those just outside the inundation zone.

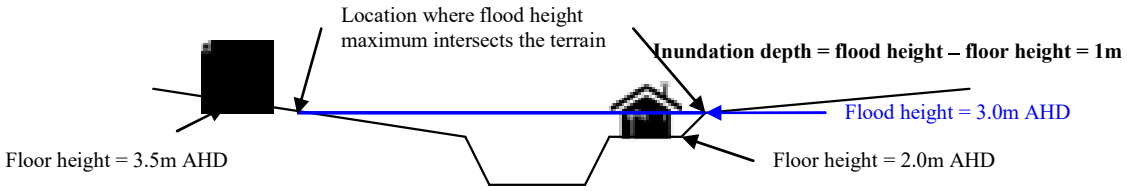

Figure G.5: Example of inundation depth estimation method

Madeleine Farrar

From: David Wightman
Sent: Friday, 5 October 2018 3:33 PM
To: Oliver Giudici
Subject: FW: Huon Valley Flood Evacuation Plan update
Attachments: Huon River FEP 2016.pdf

From: David Wightman
Sent: Thursday, 21 June 2018 11:01 AM
To: Rebecca Bell - Huon Valley Council (rbell@huonvalley.tas.gov.au) <rbell@huonvalley.tas.gov.au>; Craig Ludlow <Craig.Ludlow@entura.com.au>
Cc: Neil Smith <Neil.Smith@hydro.com.au>
Subject: Huon Valley Flood Evacuation Plan update

Hi Rebecca and Craig,

Hydro Tas are currently reviewing our Dam Safety Emergency Plan and we noted the Huon River – Flood Evacuation Plan is fast approaching its expiry date of July 2018.
The latest update to the plan (attached) was funded by Hydro Tas in 2015/16 and developed by Entura in conjunction with Huon Valley Council, Hydro and the SES.

Hydro Tas don't own the Flood Evacuation Plan, but we are happy to be involved with any workshops or meetings that are planned to discuss updates to the Flood Evacuation Plan, particularly with respect to Scotts Peak and Edgar Dams. In my conversations with you both this week, you've both indicated that there are some changes required to the plan as a result of work that Entura did with Huon Valley Council involving running the 2016 floods through the model.

Rather than organise this meeting as we have in the past, we would be keen to participate in any future meetings relating to this plan.
I'm happy to talk anytime, please give me (or Dam Safety Manager, Neil Smith) a call with any queries.

Kind regards

David

David Wightman
Senior Engineer - Dams & Civil

Hydro Tasmania

m +61 418 352 884
e david.wightman@hydro.com.au
w hydro.com.au
a 4 Elizabeth Street, Hobart TAS 7000

External Emergency Preparedness Scenario 2020

Edgar and Scott's Peak Dam Earthquake

December 2020

Contents

Appendices

Document information

Document title	External Emergency Preparedness Scenario
	Edgar and Scott's Peak Dam Earthquake
Client organisation	Hydro Tasmania
Client contact	Neil Smith - Dam Safety Manager
Project number	H-0101964 - AM&I Civil Assets FYE21

Revision history

Revision 1

Revision description	Final		
Prepared by	Prepared by	Cassandra Turner	4/03/21
Reviewed by	Reviewed by	Neil Smith	5/03/21
Approved by	Approved by	Neil Smith	5/03/21
	(name)	(signature)	(date)

1.0 Introduction to Exercise

Hydro Tasmania (HT) is obliged under the Australian National Committee on Large Dams (ANCOLD) Guidelines (Section 8.6 (ANCOLD, 2003)), to periodically exercise, test and evaluate its dam safety emergency plans. As such, an emergency simulation exercise was undertaken on the 3rd December 2020 to practice and assess the Civil and Dam Safety Emergency Plan (CDSEP) in conjunction with external stakeholders. This report documents the planning, execution and key outcomes of this event.

1.1 Introduction

The exercise centred around the scenario of a seismic induced failure of Edgar Dam (ED) and Scott's Peak Dam (SPD) at the head of the Huon River and the consequential extreme flooding of that river. The exercise was conducted with personnel from HT and members of the Huon Valley Council Emergency Management Committee. Whilst it was an instance of exercising the CDSEP, the aim of this exercise was primarily to build stakeholder relationships and awareness of the dam safety risk in the Huon Valley region.

This report documents the following:

- A brief description of the background of these dams as relevant to the exercise;
- A record of exercise participants;
- [redacted]
- [redacted]

1.2 Emergency Management Plans

Hydro Tasmania's CDSEP outlines the roles and responsibilities of HT staff and other key stakeholders in the event of a dam safety event or dam failure. The CDSEP is generic as it covers all HT dams, including those featured in this exercise (Scott's Peak and Edgar Dams). The CDSEP includes key actions to be undertaken in a dam safety event, including early communication with external emergency services agencies who will be responsible for organising downstream evacuation.

The Huon Valley Flood Evacuation Plan is owned by Huon Valley Council (HVC) but was created in collaboration with Hydro Tasmania. It includes information on both natural floods and the extreme floods that would be caused by dam break of Edgar and/or Scott's Peak dams.

2.0 Scott's Peak and Edgar Dams

2.1 Introducing Scott's Peak and Edgar Dams

Scott's Peak and Edgar Dams (in conjunction with Serpentine dam) create the impoundment of the Serpentine and Huon Rivers known as Lake Pedder. While the Serpentine River flows to the west, the Huon River flows east and passes through populated areas of the Huon Valley. The largest settlement on the river is Huonville (pop. ~2700) with smaller settlements at Judbury (~400), Glen Huon (~600) and Franklin (~1000).

Scott's Peak Dam (cc. 1970-1972) is a 1067m long bitumen concrete faced rockfill dam with a maximum height of 43m. Edgar Dam (cc. 1970-1972) is a 430m zoned earth fill dam with a concrete cap. It has a maximum height of 17m and is located higher on the reservoir rim than Scott's Peak. The two dams are approx. 3km apart on the southern shore of Lake Pedder.

2.2 Edgar Fault Seismicity

A fault line is evident running approximately north-south along the right abutment of Edgar dam. At the time of the dam's construction, this fault was determined to be inactive. More recent studies however, have determined that the fault can still be considered active. Although unlikely, a significant rupture of this fault would cause significant damage to both Scott's Peak and Edgar Dams, which may lead to dam failure in a relatively short period of time. It is this scenario that was the focus of the emergency exercise.

Note: In recognition of HT's increased understanding of the seismic vulnerability of these assets and in light of the increasing population at risk downstream in the Huon Valley, major upgrades of these dams are being planned. Planning for these upgrades was well advanced at the time of the writing of this report however due to the magnitude and complexity of the task it may be several more years before physical mitigations are undertaken. Until these future upgrades, non-physical risk mitigation methods have been employed, such as enhancement to the real time monitoring equipment at the dams and efforts to increase stakeholder awareness of this dam safety risk (such as this Exercise).

2.3 Monitoring of the Dams

HT operates a remote monitoring system at Edgar and Scott's Peaks Dams. Data is collected and transmitted via dual 3G and satellite phone connections. The sites at each dam are entirely independent of each other. A summary of remote monitoring capabilities at the dams is as follows:

Asset	Monitored Feature	Monitoring Method	Transmission
Scott's Peak Dam	Leakage	3x v-notch weirs. (Main Dam, below Saddle Dams, and at a specific point on Middle Saddle Dam)	Data logged & transmitted 15 minutely.
	Camera	1x multi-angle camera at Main Dam	Photos taken & transmitted hourly
Edgar Dam	Leakage	6x v-notch weirs	Data logged & transmitted 15 minutely.
	Camera	1x multi-angle camera	Photos taken & transmitted hourly
Lake Pedder	Lake level	1x telemetered lake level sensor at Serpentine Dam	Data logged & transmitted 15 minutely.
Region	Seismicity	1x seismograph at Scott's Peak Dam (Plus a network of 8 other seismographs state-wide operated by HT and others)	Data logged continuously & transmitted 10 minutely & upon event.

Table 1: Summary of remote monitoring at Edgar and Scott's Peak Dam

2.4 Modelling of an Earthquake induced flood

As part of its emergency preparedness, HT produce flood inundation maps for Dams with downstream populations. These maps are shared with the emergency services for use in a dam safety emergency. The most recent flood inundation study for Scott's Peak and Edgars Dams was undertaken in 2014 (*Scott's Peak Dam and Edgar Dam Earthquake Loading Failure Consequence Assessment*, Entura). This included modelling and mapping of the following earthquake induced failure scenarios:

- Combined Edgar and Scott's Peak Dams failure, with Scott's Peak Dam failing 48 hours after Edgar;
- Edgar Dam failure only;
- Simultaneous Scott's Peak and Edgar Dams failure; and
- Scott's Peak East Saddle Dam only failure.

Flood inundation maps can be viewed via the Civil and Dam Safety Emergency Plan.

3.0 The Emergency Preparedness Exercise

The exercise was undertaken on the afternoon of the 3rd December 2020 at the Huon Valley Council Chambers in Huonville.

3.1 Exercise Participants

The following HT personnel participated in the emergency exercise

- Cassandra Turner – scenario author and facilitator (CT)
- Neil Smith – Dam Safety Manger – participant (NS)
- Lyndon Johnson – participant/ support to DSM (LJ)
- Oliver Giudici – participant / support to DSM (OG)

The following External Stakeholders are members of the Huon Valley Council Emergency Management Committee and were participants in the exercise:

- Huon Valley Council – Rebecca Bell (RB)
- Tasmania Police – Andrew Fogarty (DF)
- Tasmania Police – Jason Elmer (JE)
- Tasmania Fire Service – Stuart Males (SM)
- State Emergency Service – Caroline Noonan (CN)
- TasNetworks – Chong Ong (CO)
- Bureau of Meteorology – Ann Conroy (AC)
- Kingsborough Council – Belinda Loxley (BL)
- Parks and Wildlife Service – Ian Marmion (IM)

3.2 Exercise Proceedings

The exercise was undertaken in the afternoon (12:30-4pm) of the 3rd December 2020 at the Huon Valley Council Chambers in Huonville. Participants were in place at 12:30. Cassandra Turner (HT) acted as meeting and exercise facilitator.

The first half hour of the workshop involved introductions and housekeeping, followed by a brief explanation by the Dam Safety Manager (DSM) Neil Smith regarding the purpose of the days exercise. The

DSM emphasised that the goals of the day were to foster communication lines, awareness of the Scott's Peak and Edgar Dams and to determine if any critical information was missing from the CDSEP.

The participants were then provided with a basic introduction to Scott's Peak and Edgar Dams by Oliver Giudici (HT), with particular focus on the local area seismicity and preliminary plans for future dam safety upgrades at both dams.

The rules of the exercise were then discussed by Cassandra Turner (HT):

- The exercise was contained to that room's participants (no external contact etc);
- The exercise would feature an accelerated timeline covering several days. New information and time steps would be interjected by the facilitator periodically;
- The exercise would be immediately terminated in the event of an actual emergency event. Any such communication would be identified with the prefix 'No Duff'; and
- The facilitator would guide and modify the scenario and conversation as required to steer the exercise towards a satisfactory conclusion.

The exercise proper commenced at 1pm. A summary of the scenario is included in the following section of the report and a copy of the full presentation is included in Appendix A. The original power point presentation can be found here: Edgar and Scott's Peak Dams Emergency Exercise 2020-12.pptx

The scenario was concluded at ~15:45. A wrap up discussion and debrief took place and the workshop was concluded at 16:00.

- [redacted]

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3.4 [redacted]

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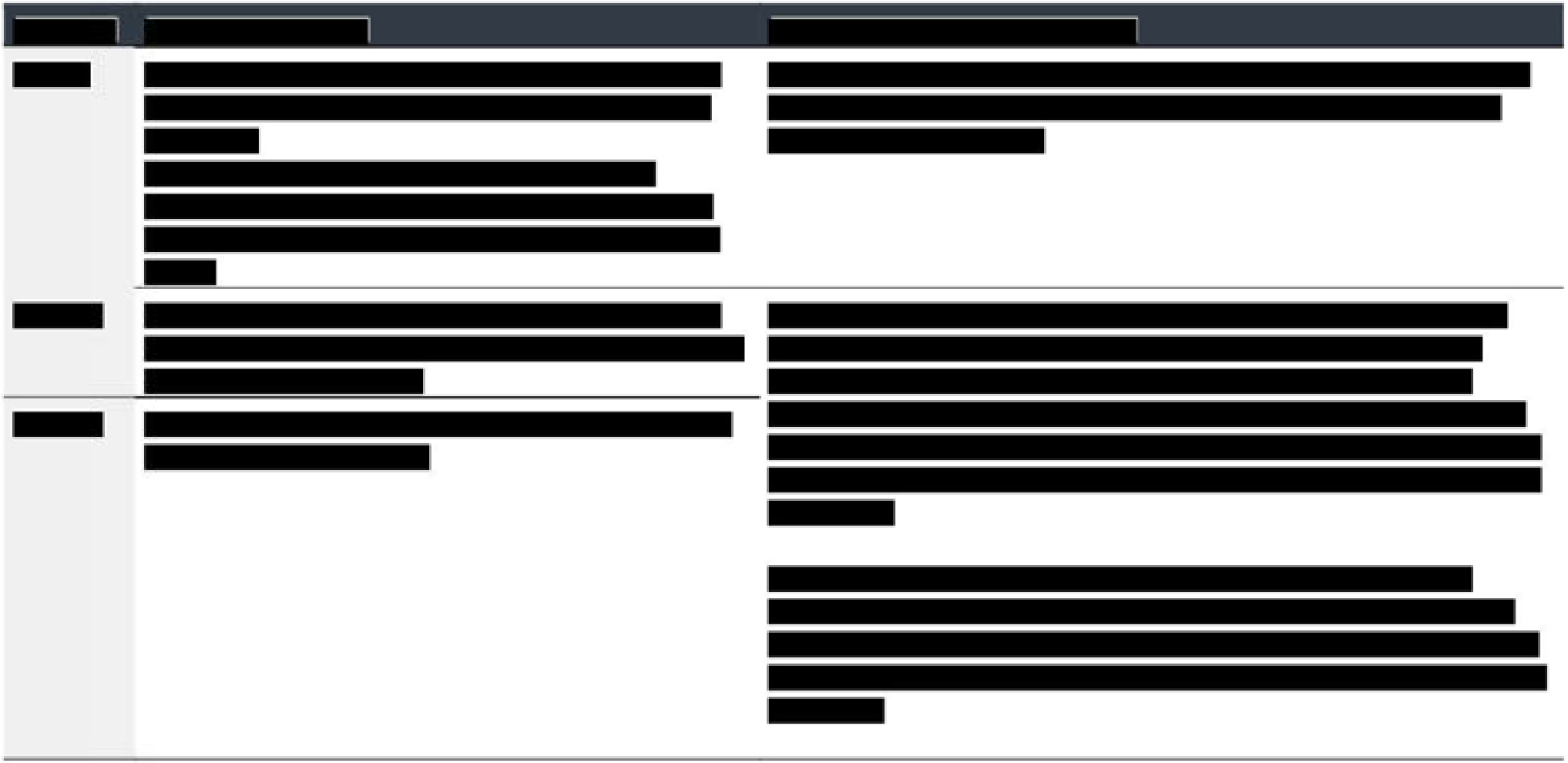

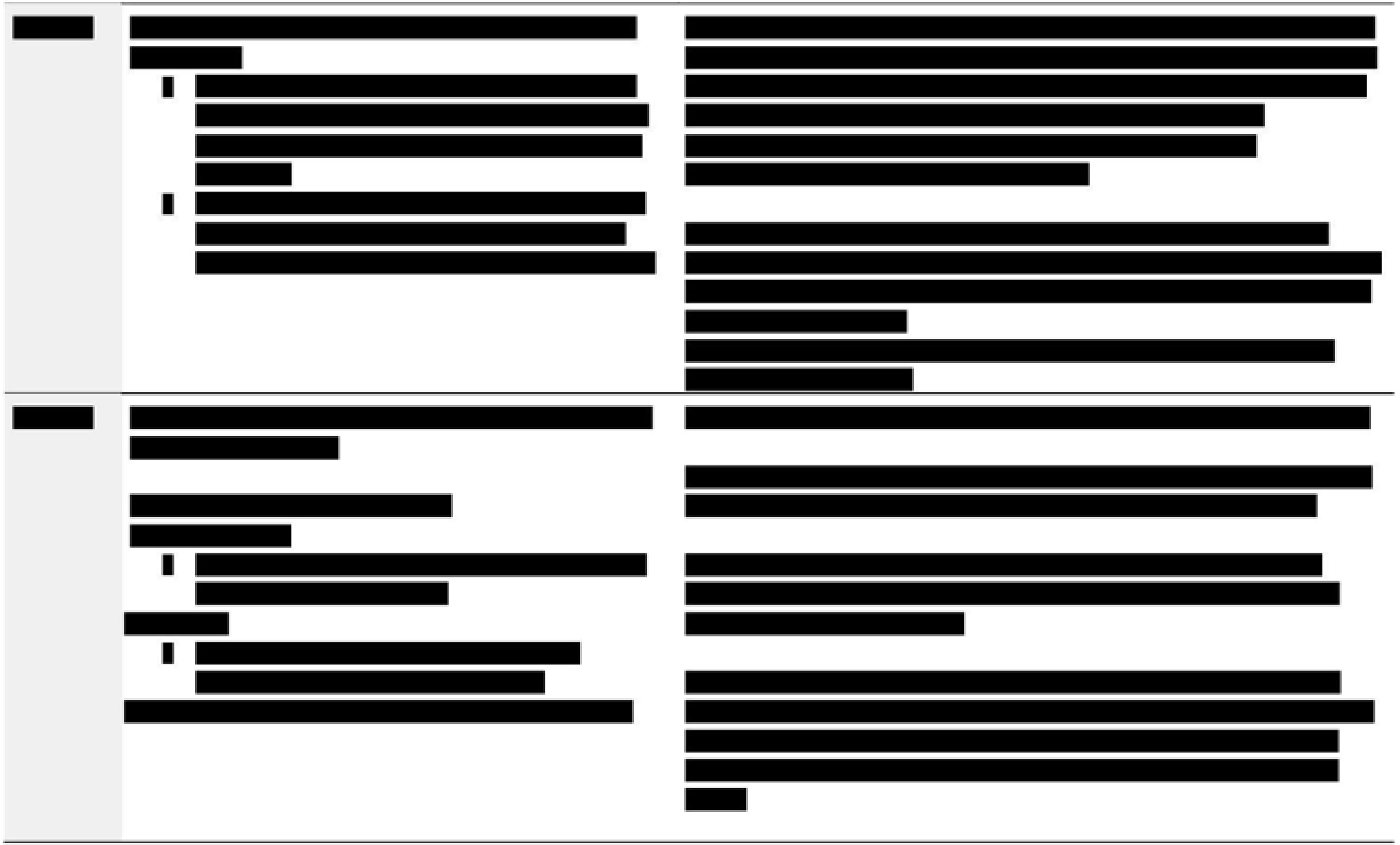

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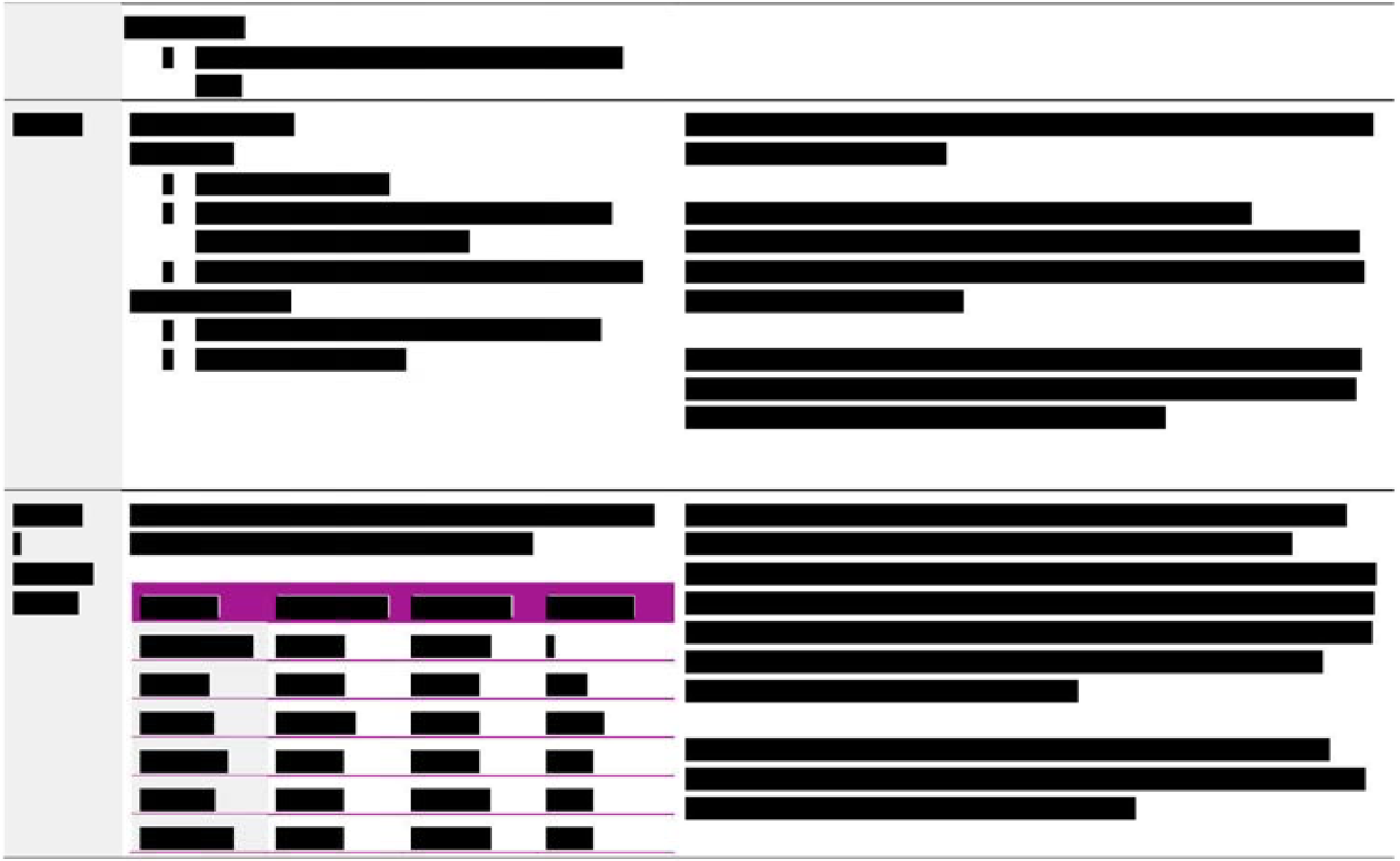
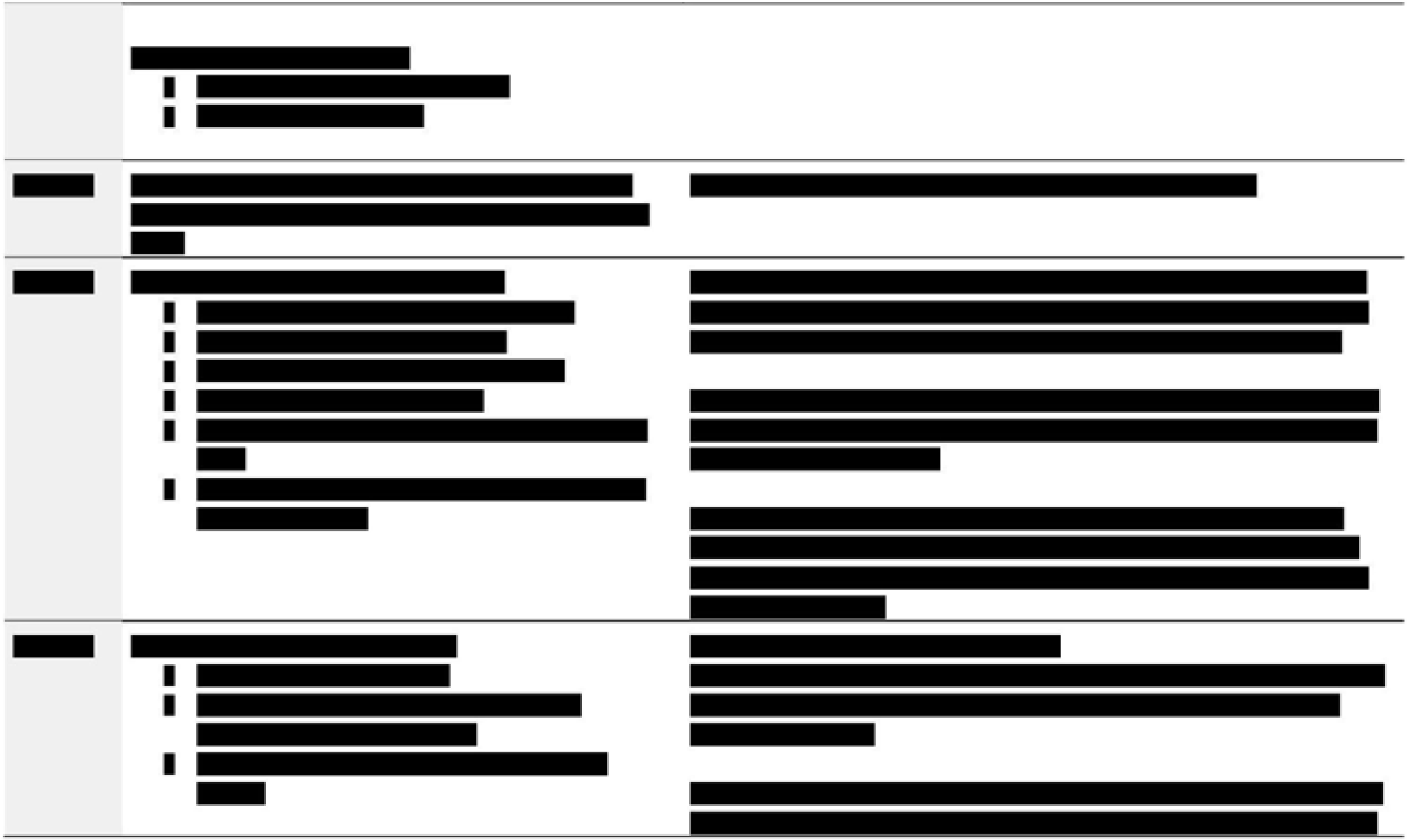
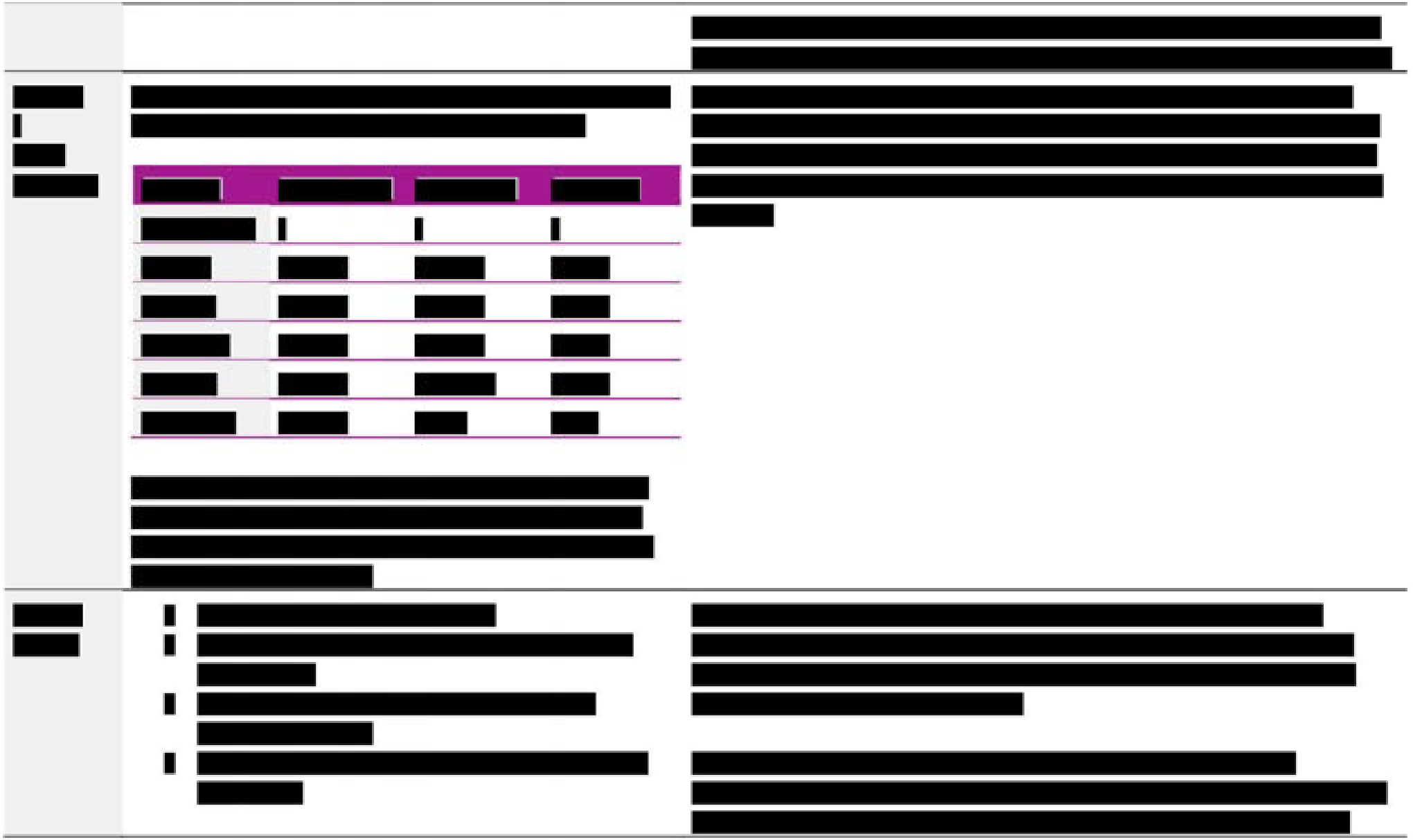
1:00pm	[redacted]







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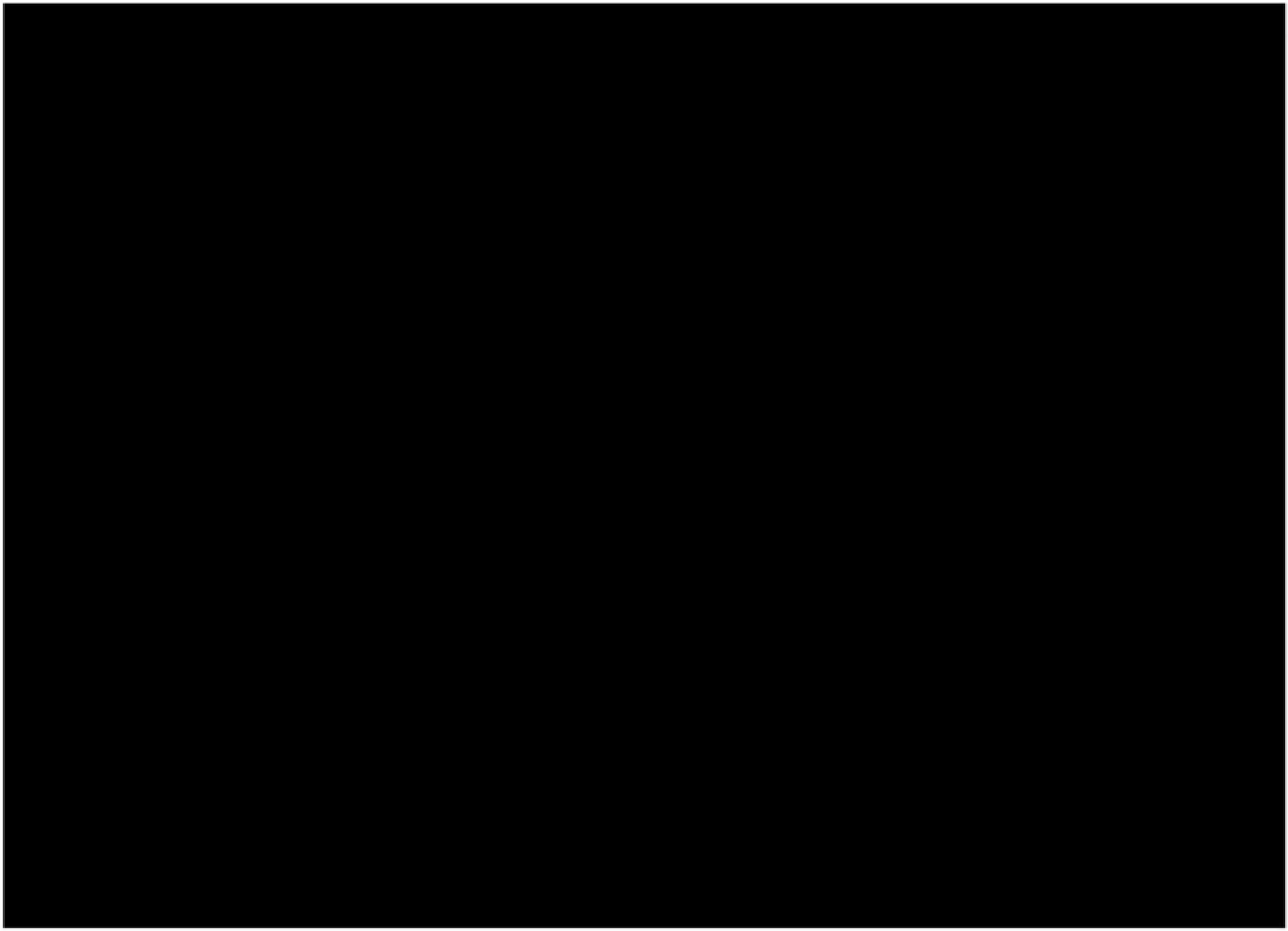

Hydro Group

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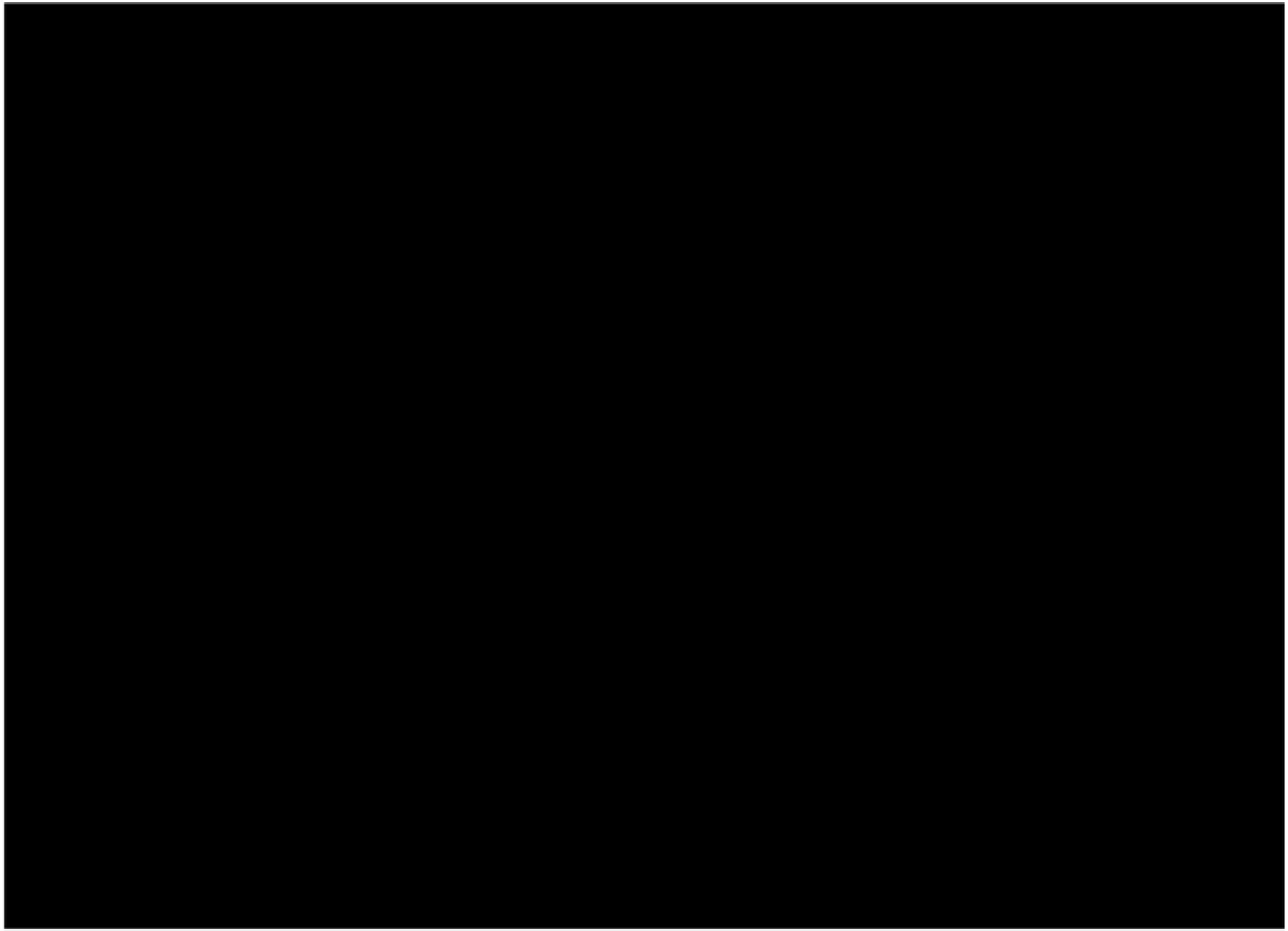
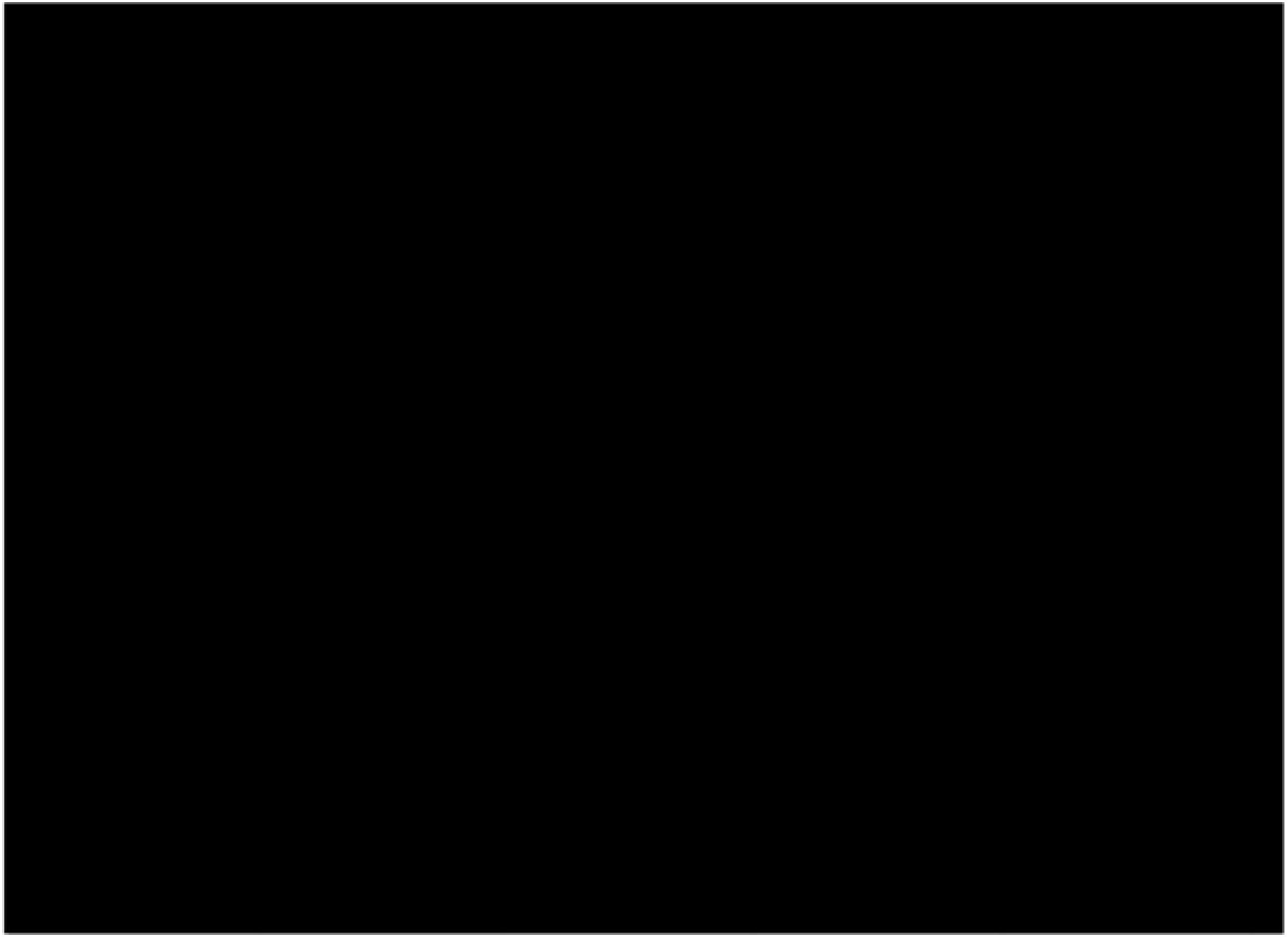
Group





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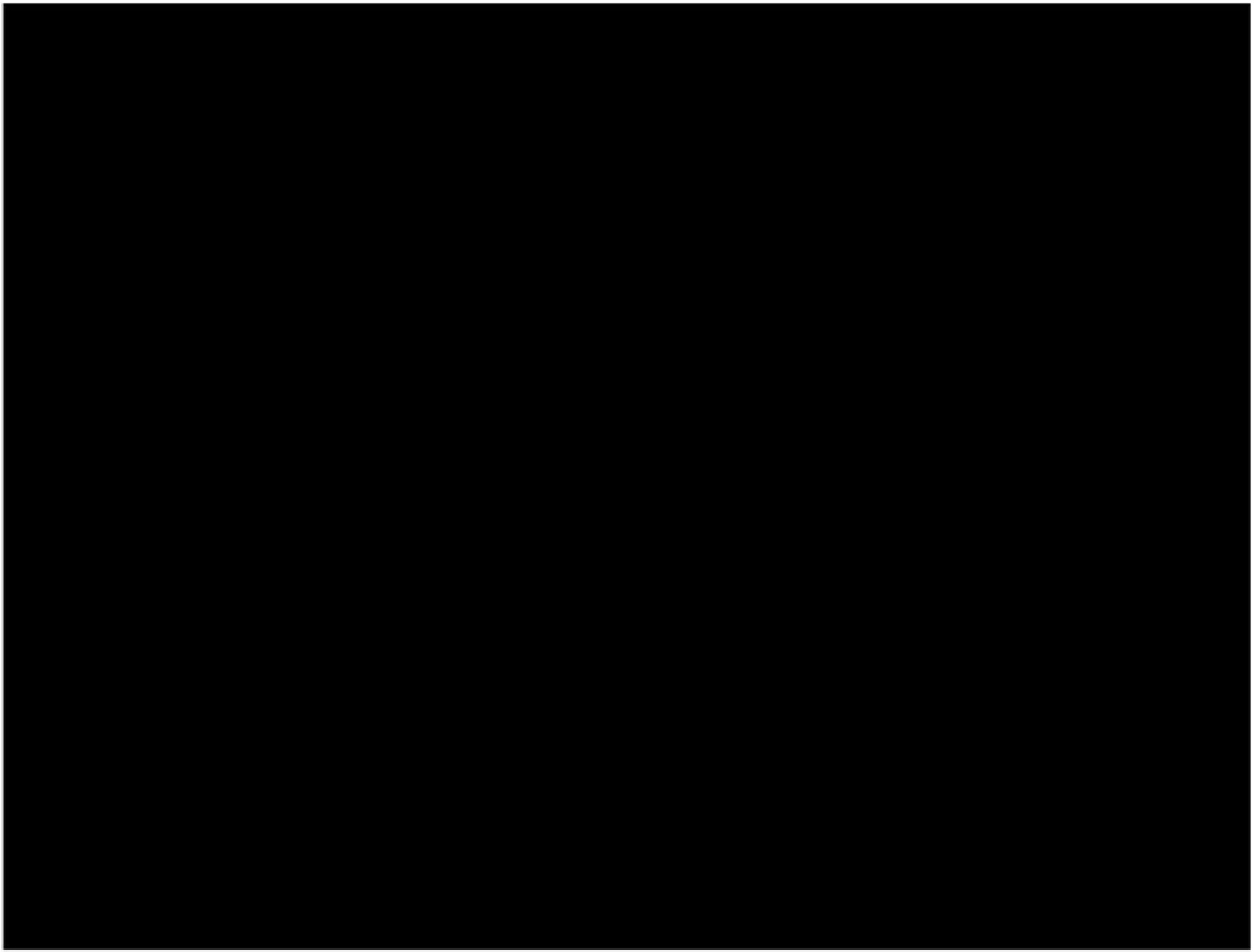

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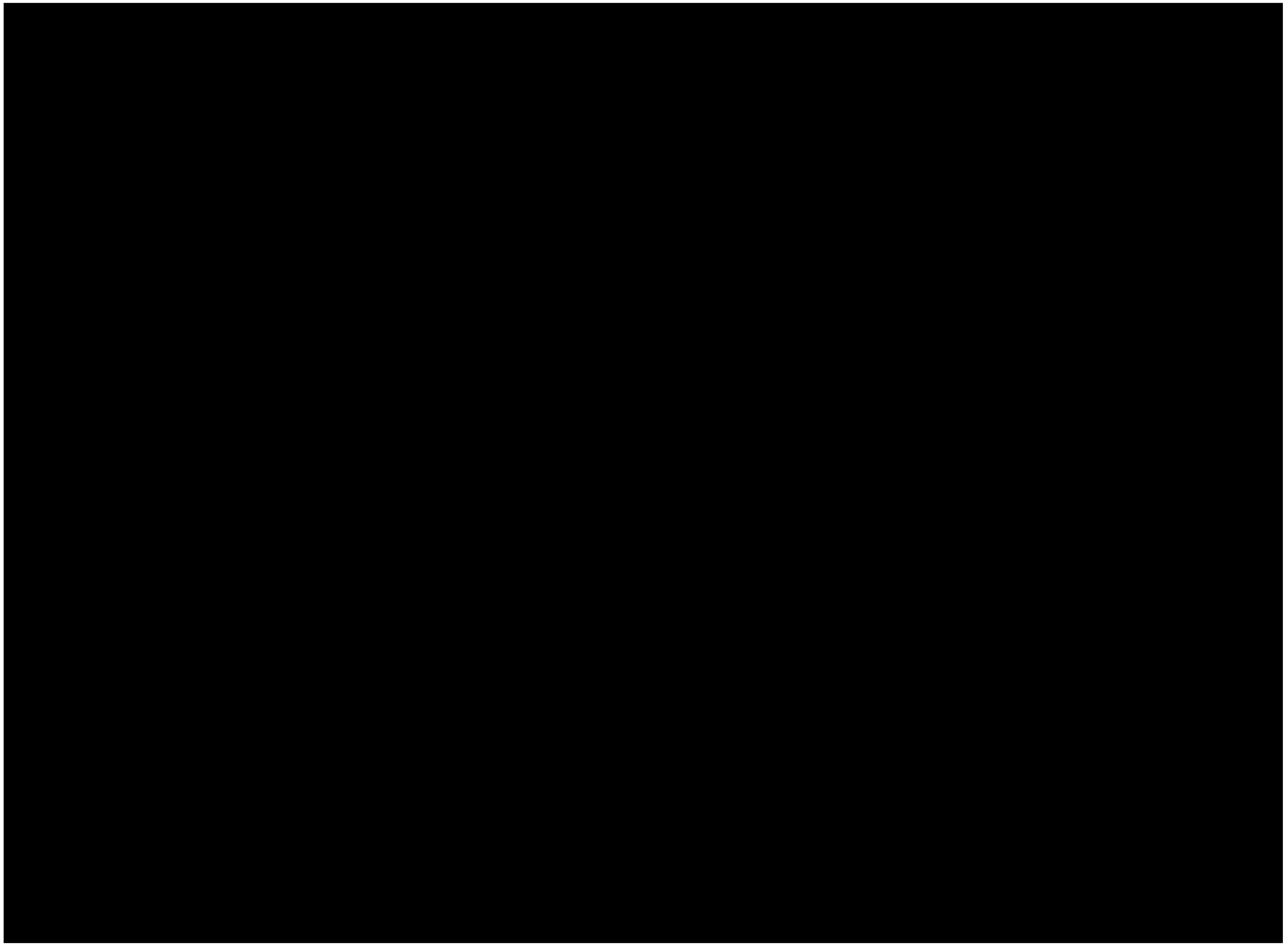

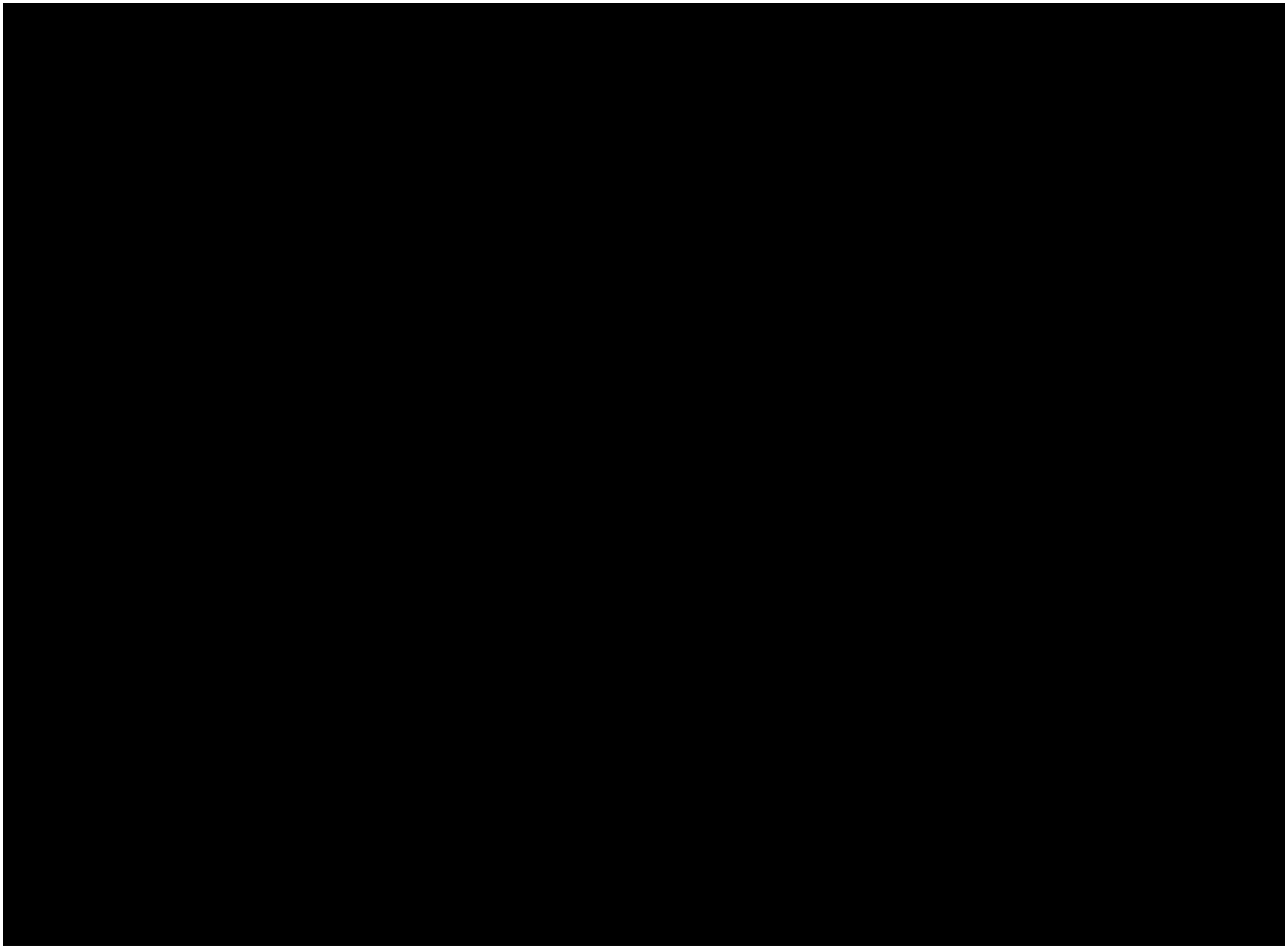

Madeleine Farrar

From: Kate Bradshaw
Sent: Friday, 17 May 2024 5:12 PM
To: Madeleine Farrar
Subject: RTI - MICHAEL WALLIS - ONE RECORD ONLY
Attachments: Building data.xlsx

From: Michael Wallis <Michael.Wallis@entura.com.au>
Sent: Friday, May 17, 2024 3:07 PM
To: Kate Bradshaw <kate.bradshaw@hydro.com.au>
Subject: fyi

Hi Kate,

Below is the only email to Rebecca Bell at HVC that I have, except for a thank you reply, since 2017.

Michael Wallis
m 0473 248 203

From: Michael Wallis
Sent: Thursday, June 6, 2019 9:59 AM
To: rbell@huonvalley.tas.gov.au
Cc: Craig Ludlow <Craig.Ludlow@entura.com.au>
Subject: Building data.xlsx

Hi Rebecca,

Please find attached an Excel spreadsheet containing a list of properties with addresses and floor levels as used in the Huon River Flood Evacuation Plan.

Please contact me if you have any queries.

Regards

Michael Wallis | Specialist Civil Engineer
DipCivilEng, MIEAust, CPEng, NER, APEC Engineer, IntPE(Aus)

entura

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