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creating better coasts and ports

Point Moore Inundation & Coastal Processes Study

In Western Australia, coastal development is guided by State Planning Policy 2.6: The State Coastal Planning Policy (SPP2.6). This policy outlines the general requirements for new development on the coastline in terms of avoiding or managing risks caused by coastal inundation (flooding) or coastal erosion.

SPP2.6 outlines that new development should be safe from coastal inundation caused by an extreme inundation event that has a 0.2% chance of occurring each year. In other words, this event would occur once every 500 years on average. Another way to say this is that the event would have an Average Recurrence Interval (abbreviated to ARI) of 500 years.

For coastal erosion, SPP2.6 states that new development should be safe from an erosion event that has a 1% chance of occurring each year (or would occur once every 100 years on average – i.e. the 100 year ARI event).

In addition to these storm events, the potential impacts of sea level rise and ongoing changes to the shoreline need to be considered when determining appropriate areas for new development.

While the SPP2.6 guidelines relate mainly to the requirements for new development, where existing development does not meet the guidelines there is a general requirement to take action in order to reduce any risks to acceptable levels.

In 2015 a study was completed in order to understand which areas of Point Moore could be impacted by coastal inundation and erosion. This study was completed in accordance with the requirements of SPP2.6. The study involved detailed modelling and assessment of the following items:

- Detailed cyclone storm surge modelling to determine the potential inundation caused by severe cyclones.
- Analysis of available water level records to determine the potential inundation caused by non-cyclonic events.
- Modelling the potential beach and dune erosion caused by severe events.
- Assessment of historical and potential future shoreline movement caused by the action of natural coastal processes.
- Assessment of the effects of potential sea level rise (assuming 0.9 metres of sea level rise by year 2110 as required by SPP2.6) on the coastal inundation and erosion.

The results of this study are summarised on the attached plans. Further details and description of these plans are provided overleaf.

The attached plans show the areas that could be impacted by coastal erosion or inundation for the Present Day, as well as the years 2030, 2070 and 2110. A description of what these plans mean, and how to read them, is provided below.

Coastal Processes Allowance Plan

The Coastal Processes Allowance Plan shows 4 different coloured lines. Each of these lines represents the extent of possible impact of coastal erosion over each planning horizon. The locations of these lines have been determined in accordance with the requirements of SPP2.6. As an example, anything on the ocean side of the **red** line could be vulnerable to coastal erosion by the year 2110.

Coastal Inundation Mapping Plans

The Inundation Mapping Plans show areas that could be inundated by different events for each of the timeframes outlined above. Each of the different plots represents a different timeframe. The different colours represent the potential areas of inundation associated with different event severities. On each of the plots, the area that is shaded **purple** represents the area that would be inundated during the 20 year ARI event; the area that is shaded **blue** represents the additional area that would be inundated during the 100 year ARI event; and the area that is shaded **green** represents the additional area that could be inundated by the 500 year ARI event.

The difference between the plots (as each plot represents a different time), is caused by the potential impact of sea level rise.

Coastal Inundation Depth Plans

The Inundation Depth Plans have been prepared to show the potential depth of inundation caused by the 20, 100 and 500 year ARI events at the year 2030, as well as the 500 year ARI event in 2110. The different colours on these plans show the different inundation depths, as indicated on the legend. For example, anything that is shaded **pink** on the plan would have an inundation depth of between 2.0 and 2.5 metres.

Combined Coastal Vulnerability Mapping Plans

The Combined Coastal Vulnerability Mapping Plans identify the areas that would be impacted by the 500 year ARI inundation event and/or the Coastal Processes Allowance for each timeframe. For example, on the plan depicting the year 2030, the shading depicts the area that would be subject to inundation during the 500 year ARI event as well as the area that would be potentially vulnerable to coastal erosion by 2030 (as shown on the Coastal Processes Allowance Plan).

The significance of these combined plans is that the shaded areas represent the areas that would not be developable under SPP2.6 for each of the different timeframes.

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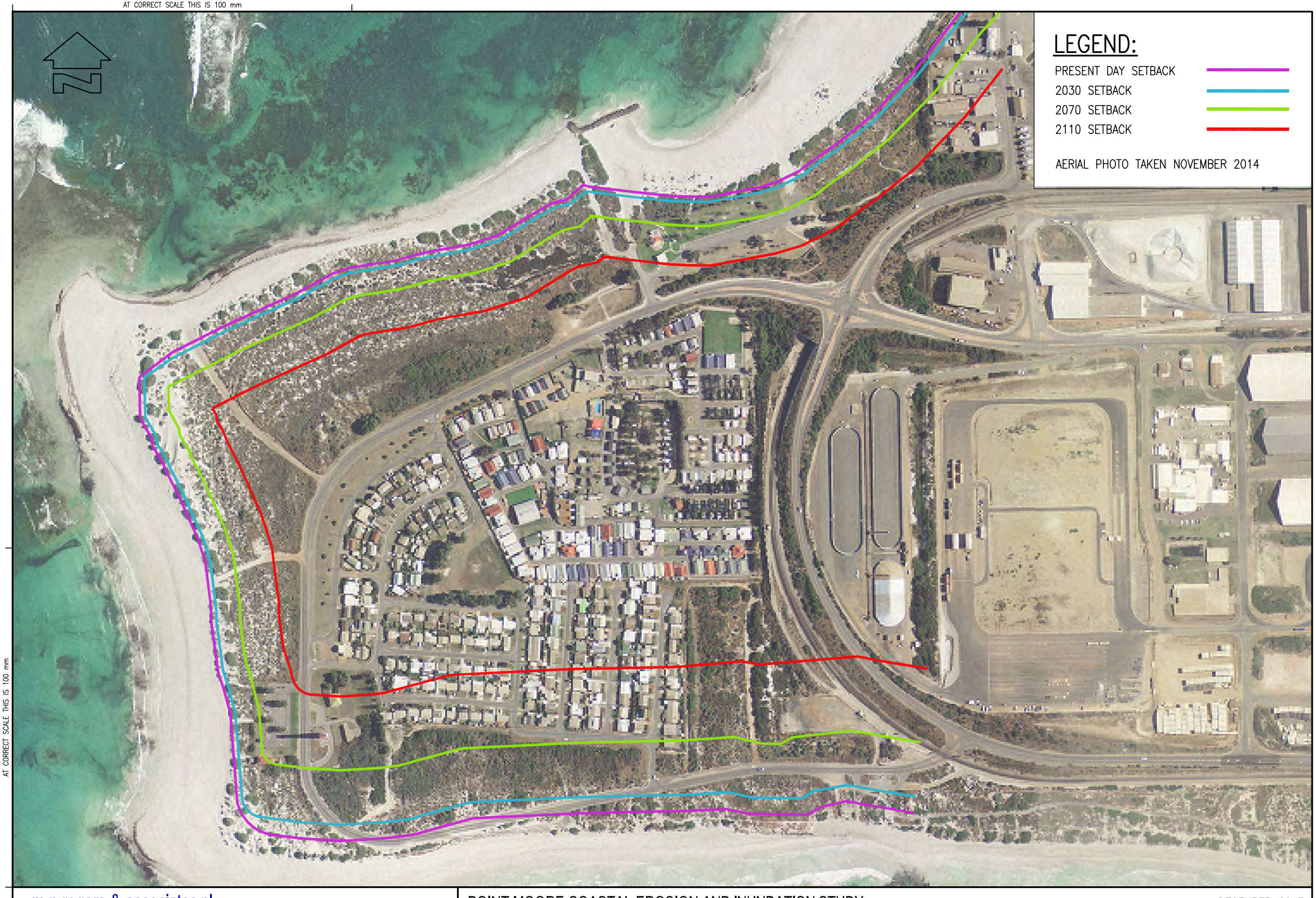

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POINT MOORE COASTAL EROSION AND INUNDATION STUDY

COASTAL PROCESSES ALLOWANCES

SCALE AT A3 1:4,000

DECEMBER 2015

D1242-01-02(D)

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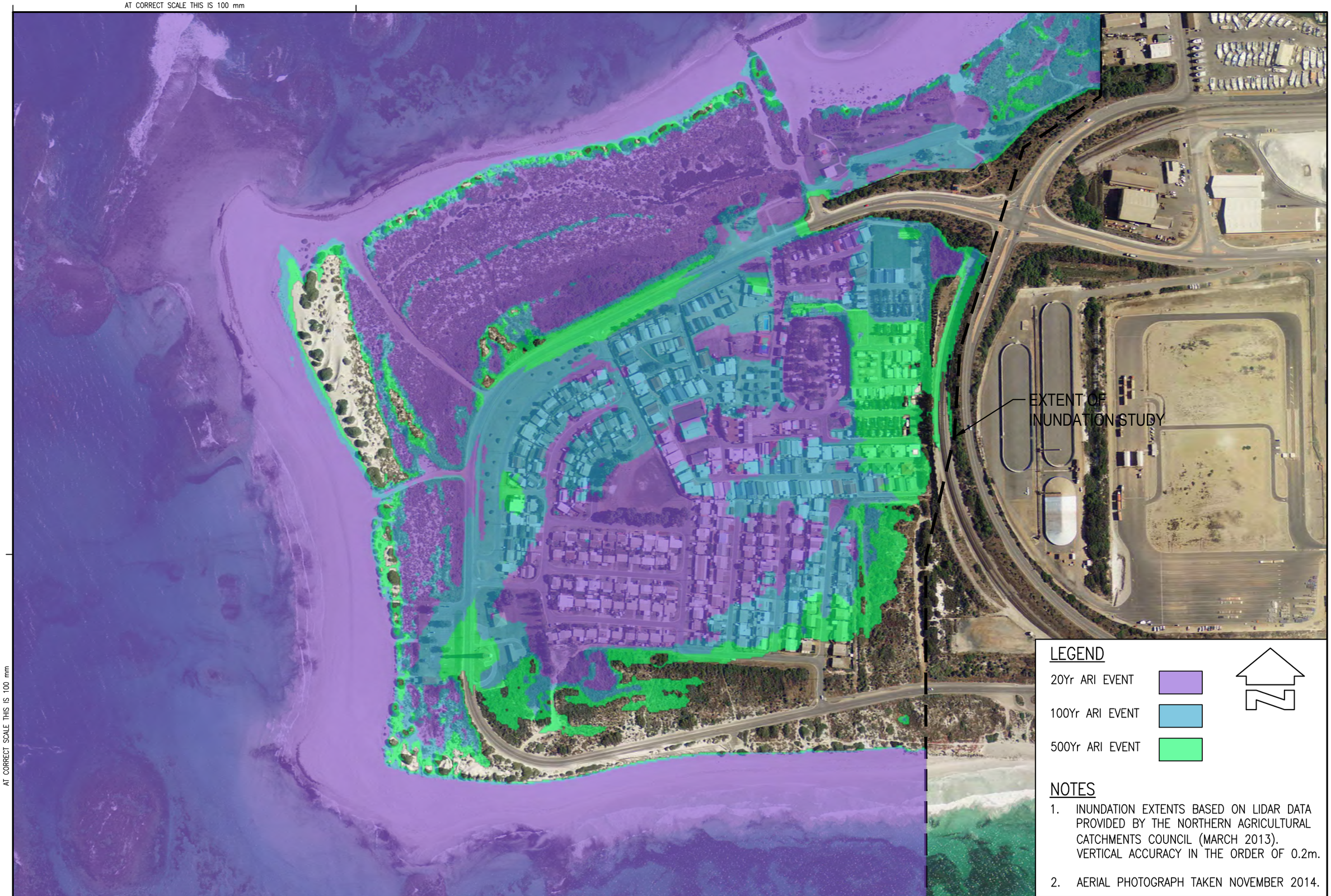

AT CORRECT SCALE THIS IS 100 mm

LEGEND

20Yr ARI EVENT

100Yr ARI EVENT

500Yr ARI EVENT

N

NOTES

1. INUNDATION EXTENTS BASED ON LIDAR DATA PROVIDED BY THE NORTHERN AGRICULTURAL CATCHMENTS COUNCIL (MARCH 2013). VERTICAL ACCURACY IN THE ORDER OF 0.2m.
2. AERIAL PHOTOGRAPH TAKEN NOVEMBER 2014.

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POINT MOORE COASTAL EROSION AND INUNDATION STUDY

INUNDATION MAPPING – PRESENT DAY

JULY 2015

SCALE AT A3 1:4,000

D1242-02-01(B)

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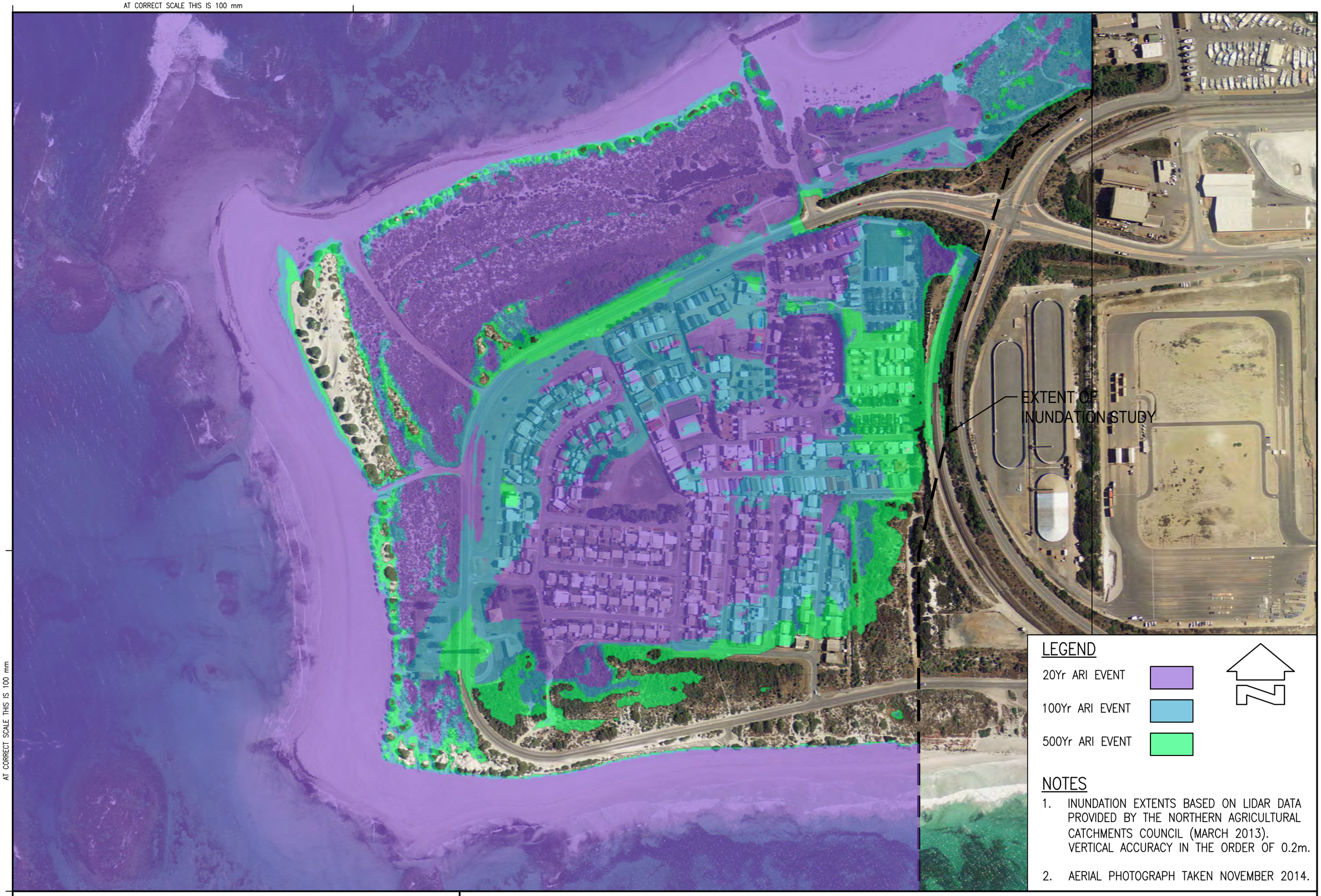

AT CORRECT SCALE THIS IS 100 mm

LEGEND

20Yr ARI EVENT

100Yr ARI EVENT

500Yr ARI EVENT

NOTES

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POINT MOORE COASTAL EROSION AND INUNDATION STUDY

INUNDATION MAPPING – 2030 (+0.07 SLR)

SCALE AT A3 1:4,000

JULY 2015

D1242-02-02(B)

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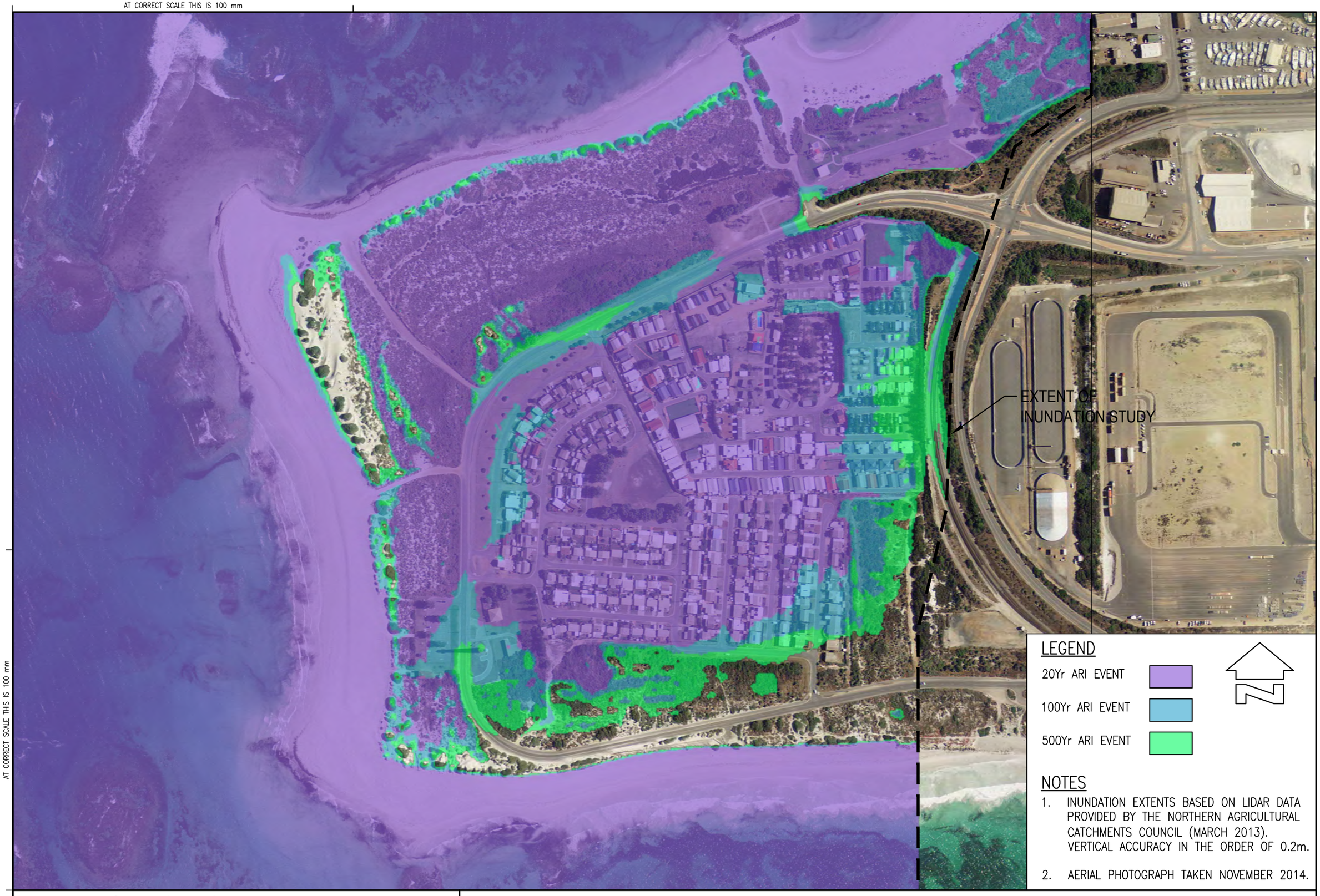

AT CORRECT SCALE THIS IS 100 mm

LEGEND

20Yr ARI EVENT

100Yr ARI EVENT

500Yr ARI EVENT

N

NOTES

1. INUNDATION EXTENTS BASED ON LIDAR DATA PROVIDED BY THE NORTHERN AGRICULTURAL CATCHMENTS COUNCIL (MARCH 2013). VERTICAL ACCURACY IN THE ORDER OF 0.2m.
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POINT MOORE COASTAL EROSION AND INUNDATION STUDY

INUNDATION MAPPING – 2070 (+0.39 SLR)

SCALE AT A3 1:4,000

JULY 2015

D1242-02-03(B)

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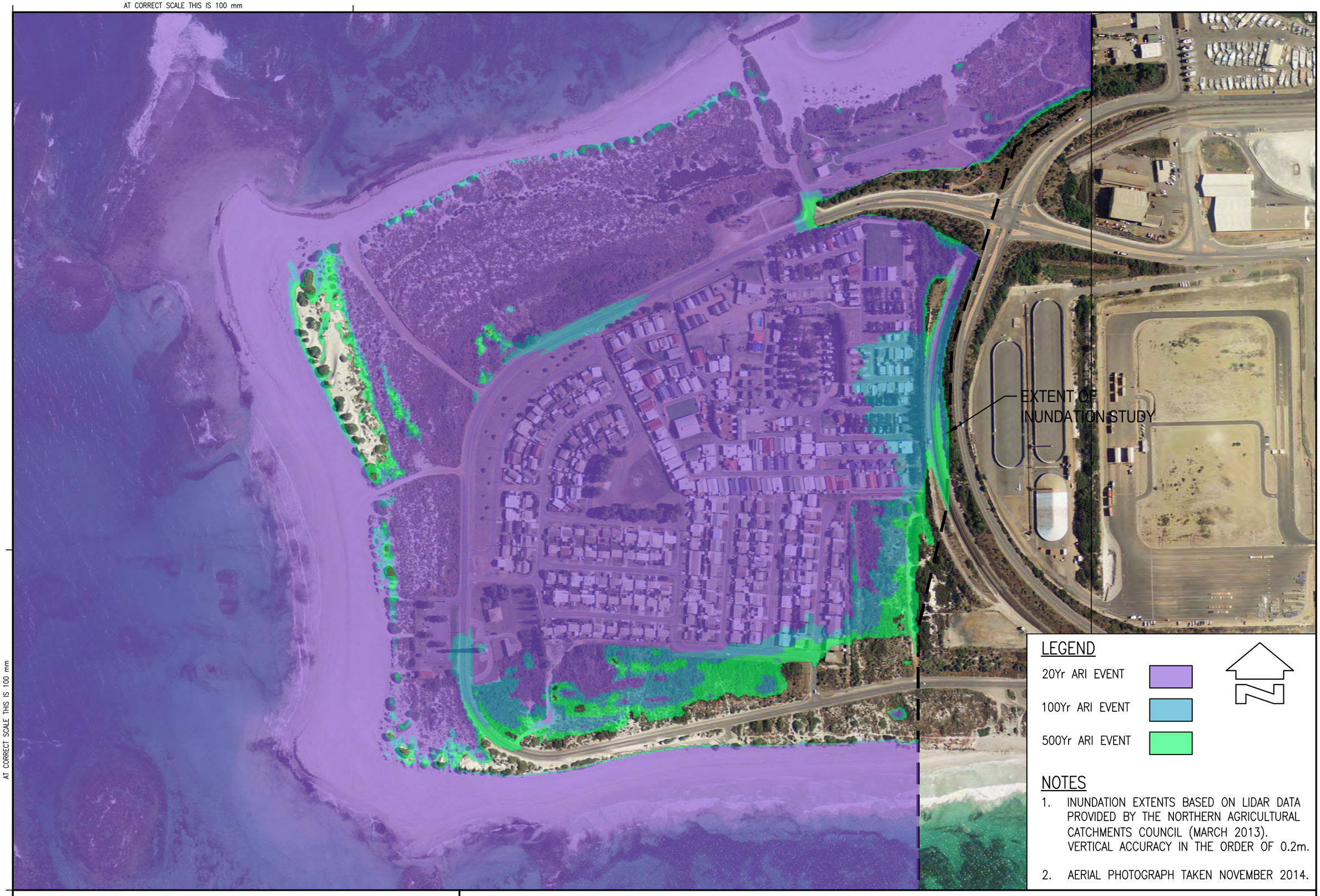

AT CORRECT SCALE THIS IS 100 mm

LEGEND

20Yr ARI EVENT

100Yr ARI EVENT

500Yr ARI EVENT

N

NOTES

1. INUNDATION EXTENTS BASED ON LIDAR DATA PROVIDED BY THE NORTHERN AGRICULTURAL CATCHMENTS COUNCIL (MARCH 2013). VERTICAL ACCURACY IN THE ORDER OF 0.2m.
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POINT MOORE COASTAL EROSION AND INUNDATION STUDY

INUNDATION MAPPING – 2110 (+0.9 SLR)

JULY 2015

SCALE AT A3 1:4,000

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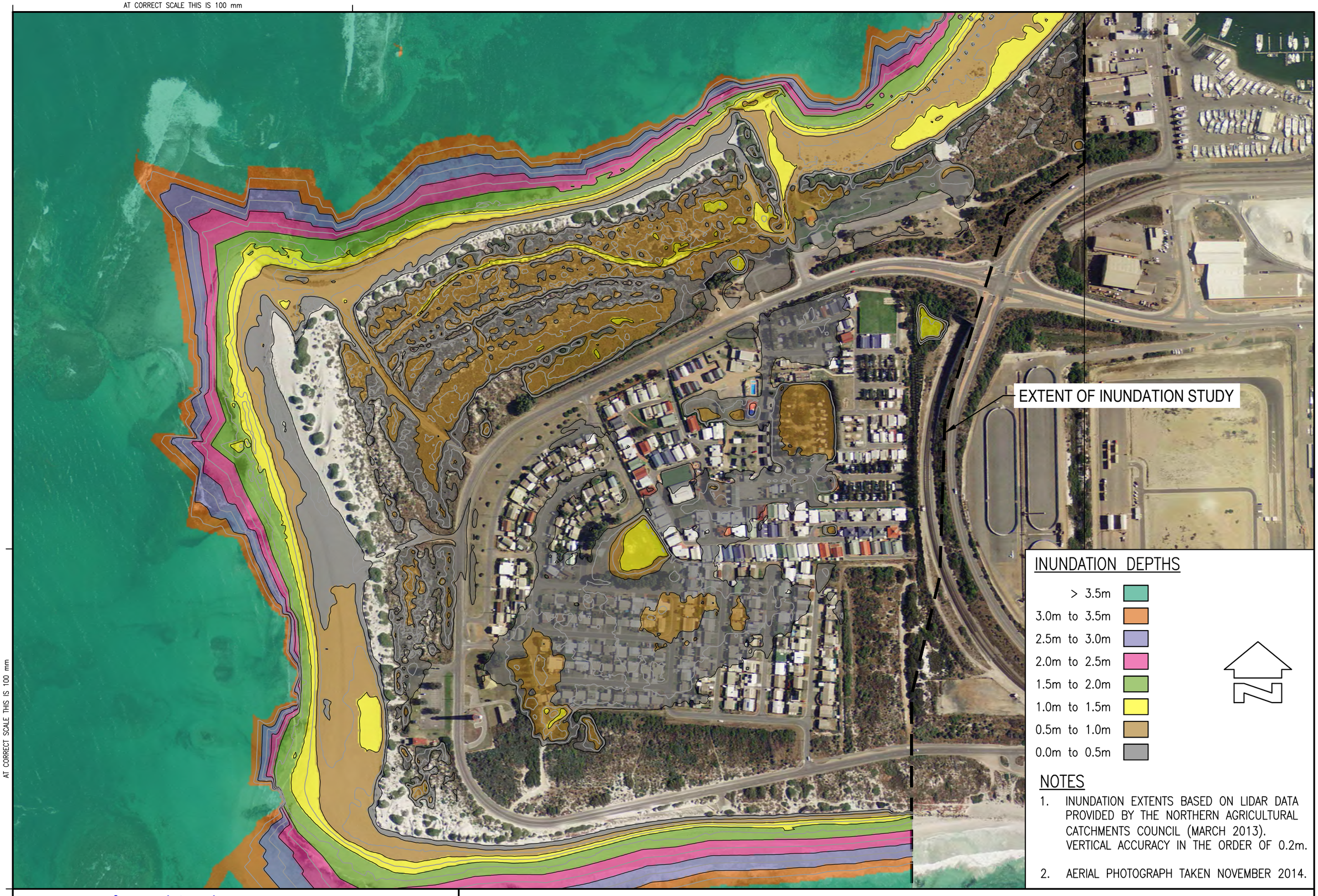

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INUNDATION DEPTHS

> 3.5m	
3.0m to 3.5m	
2.5m to 3.0m	
2.0m to 2.5m	
1.5m to 2.0m	
1.0m to 1.5m	
0.5m to 1.0m	
0.0m to 0.5m	

N

NOTES

1. INUNDATION EXTENTS BASED ON LIDAR DATA PROVIDED BY THE NORTHERN AGRICULTURAL CATCHMENTS COUNCIL (MARCH 2013). VERTICAL ACCURACY IN THE ORDER OF 0.2m.
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POINT MOORE COASTAL EROSION AND INUNDATION STUDY

INUNDATION DEPTHS – 2030 20YR ARI EVENT

JULY 2015

SCALE AT A3 1:4,000

D1242-03-01(A)

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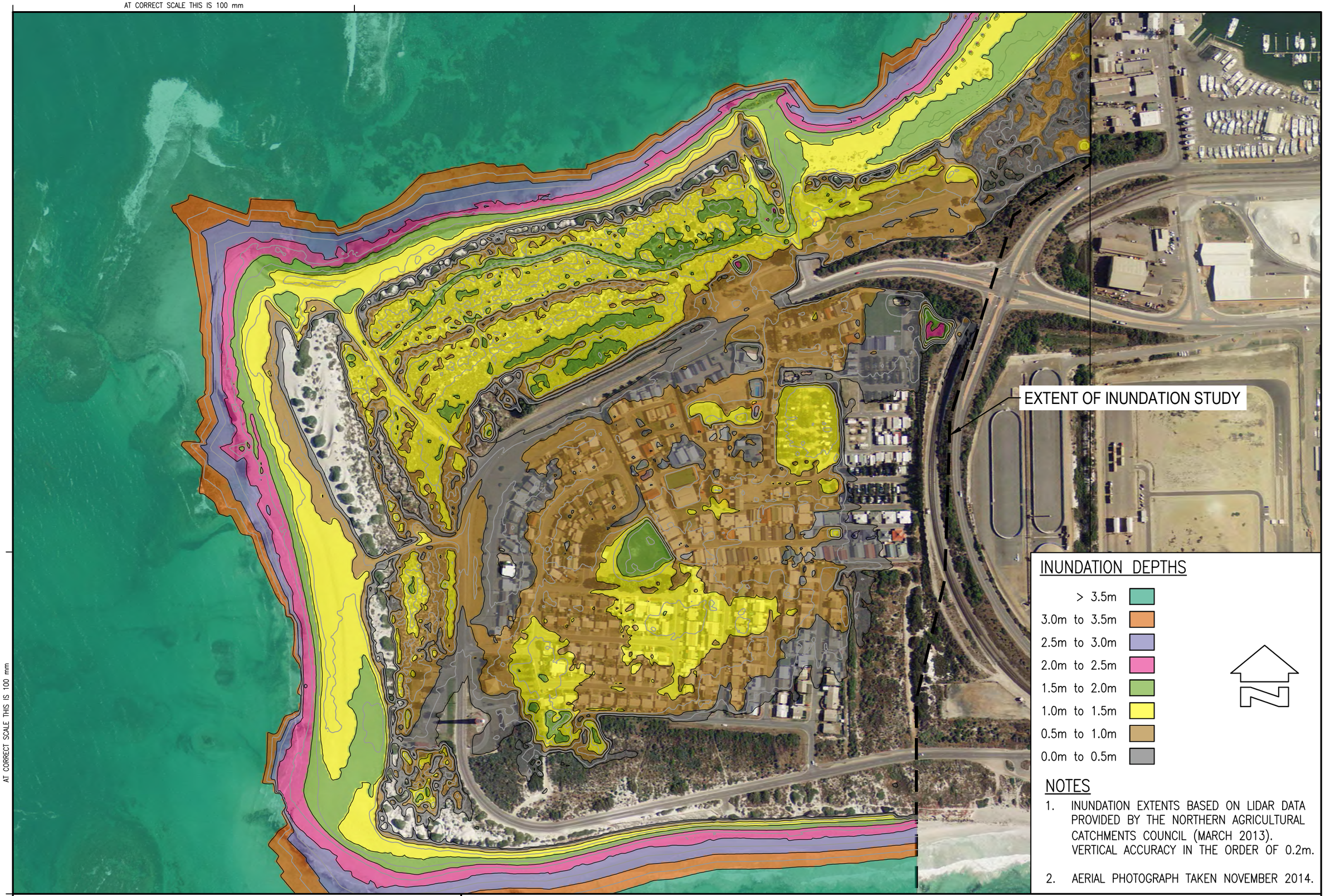

AT CORRECT SCALE THIS IS 100 mm

INUNDATION DEPTHS

> 3.5m	
3.0m to 3.5m	
2.5m to 3.0m	
2.0m to 2.5m	
1.5m to 2.0m	
1.0m to 1.5m	
0.5m to 1.0m	
0.0m to 0.5m	

NOTES

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POINT MOORE COASTAL EROSION AND INUNDATION STUDY

INUNDATION DEPTHS – 2030 100YR ARI EVENT

JULY 2015

SCALE AT A3 1:4,000

D1242-03-02(A)

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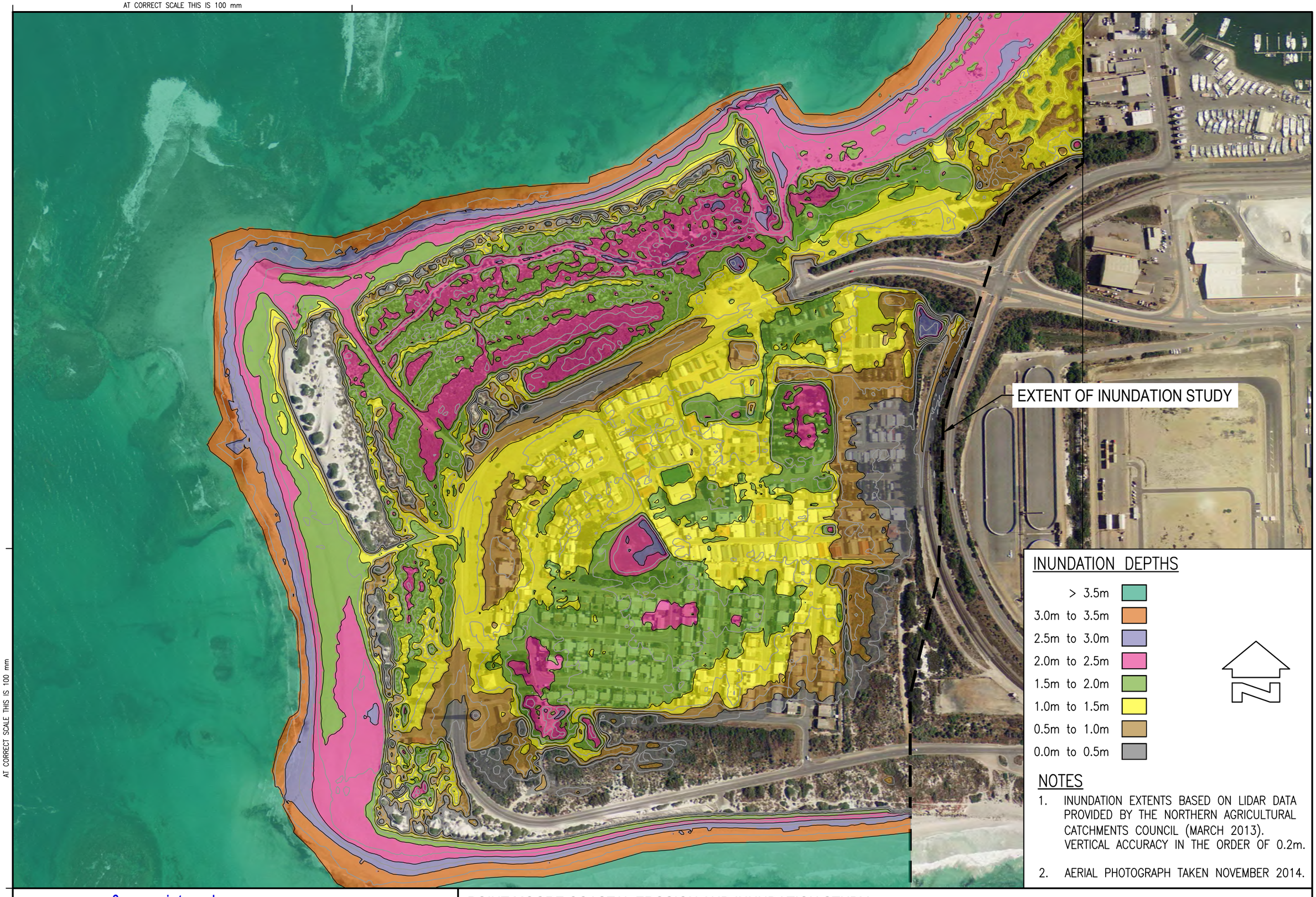

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INUNDATION DEPTHS

> 3.5m	
3.0m to 3.5m	
2.5m to 3.0m	
2.0m to 2.5m	
1.5m to 2.0m	
1.0m to 1.5m	
0.5m to 1.0m	
0.0m to 0.5m	

N

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POINT MOORE COASTAL EROSION AND INUNDATION STUDY

INUNDATION DEPTHS – 2030 500YR ARI EVENT

JULY 2015

SCALE AT A3 1:4,000

D1242-03-03(A)

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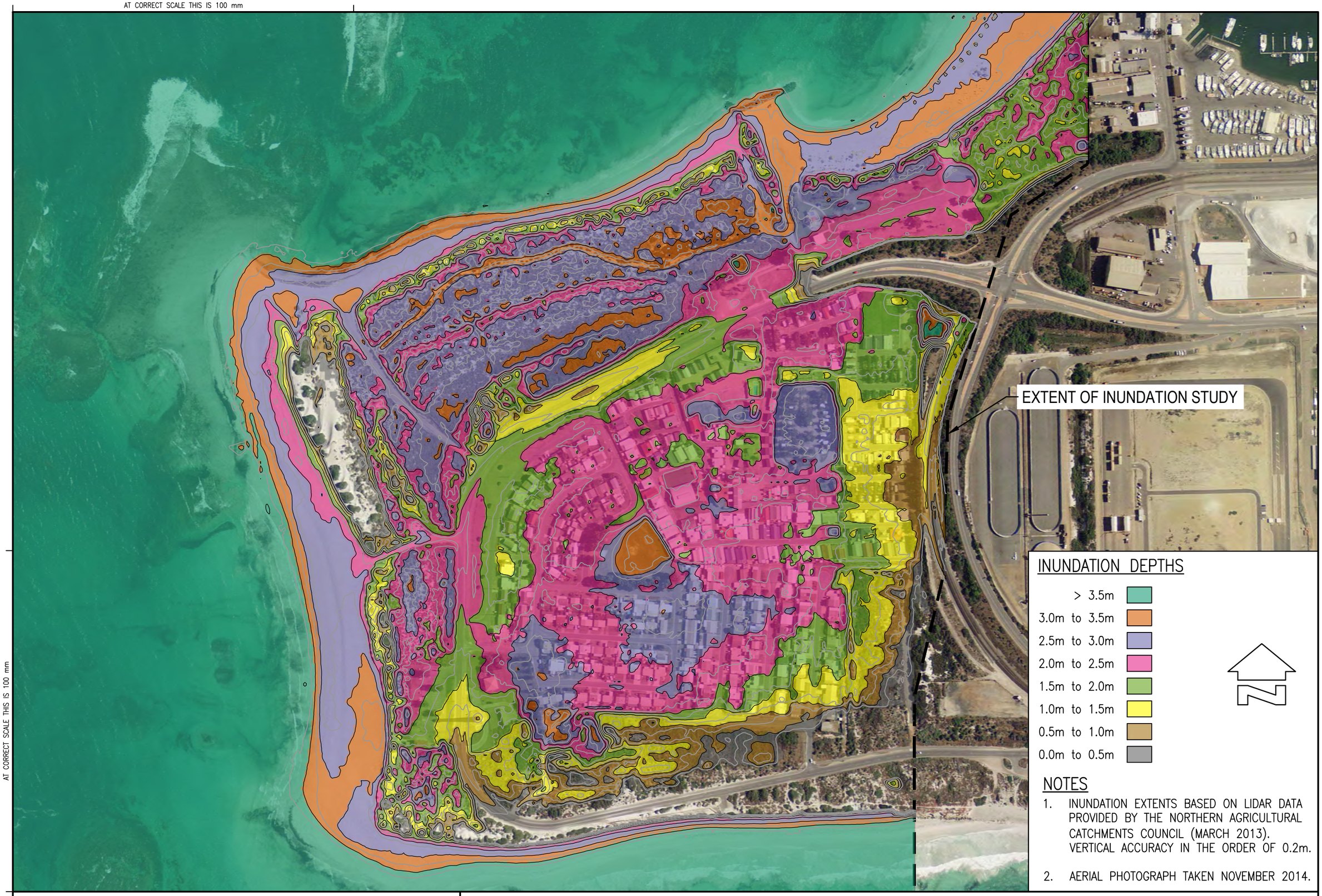

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INUNDATION DEPTHS

> 3.5m	
3.0m to 3.5m	
2.5m to 3.0m	
2.0m to 2.5m	
1.5m to 2.0m	
1.0m to 1.5m	
0.5m to 1.0m	
0.0m to 0.5m	

N

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POINT MOORE COASTAL EROSION AND INUNDATION STUDY

INUNDATION DEPTHS – 2110 500YR ARI EVENT

JULY 2015

SCALE AT A3 1:4,000

D1242-03-04(A)

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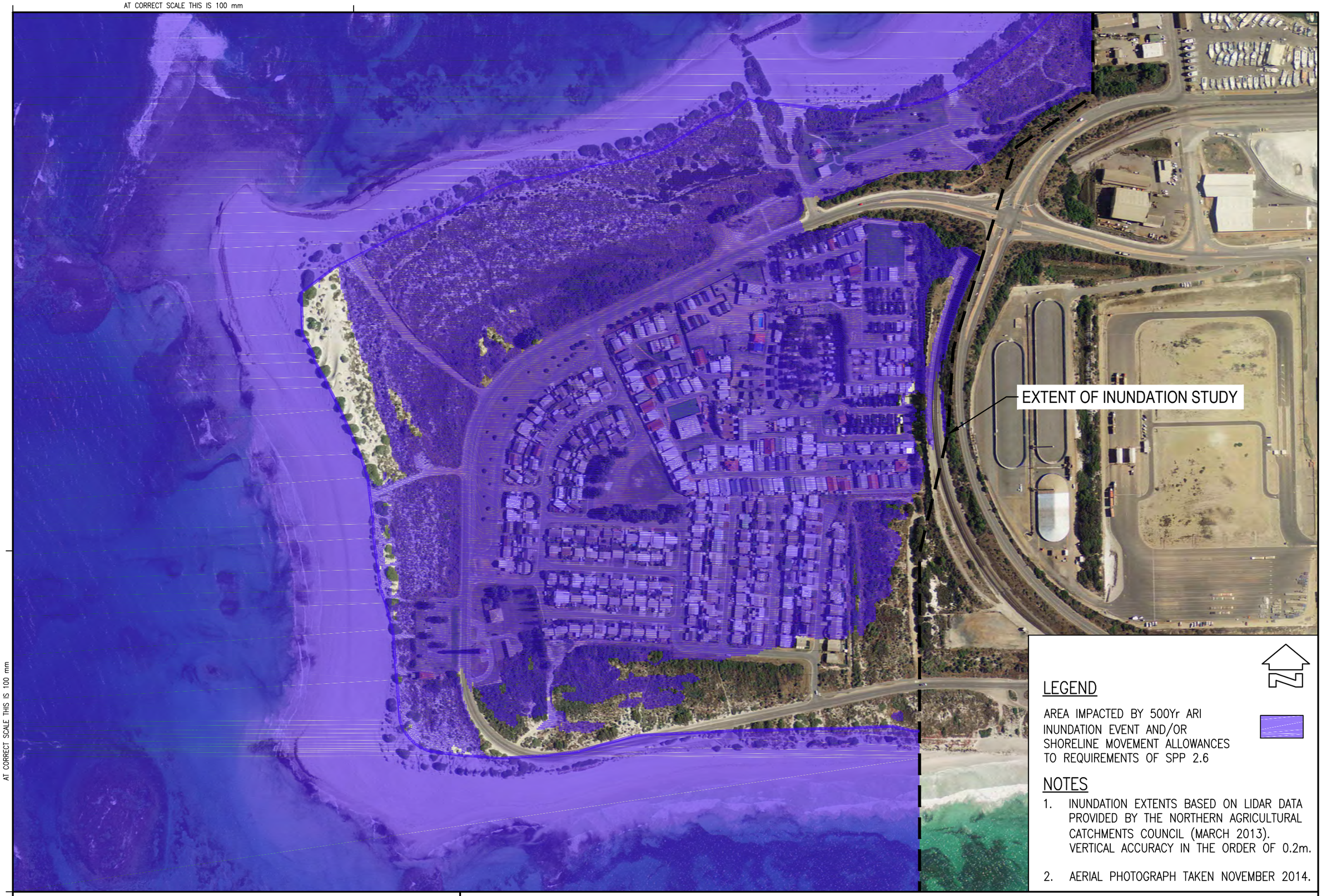

AT CORRECT SCALE THIS IS 100 mm

LEGEND

AREA IMPACTED BY 500Yr ARI INUNDATION EVENT AND/OR SHORELINE MOVEMENT ALLOWANCES TO REQUIREMENTS OF SPP 2.6

NOTES

1. INUNDATION EXTENTS BASED ON LIDAR DATA PROVIDED BY THE NORTHERN AGRICULTURAL CATCHMENTS COUNCIL (MARCH 2013). VERTICAL ACCURACY IN THE ORDER OF 0.2m.
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POINT MOORE COASTAL EROSION AND INUNDATION STUDY

COMBINED COASTAL VULNERABILITY MAPPING – PRESENT DAY

SCALE AT A3 1:4,000

DECEMBER 2015

D1242-06-01(B)

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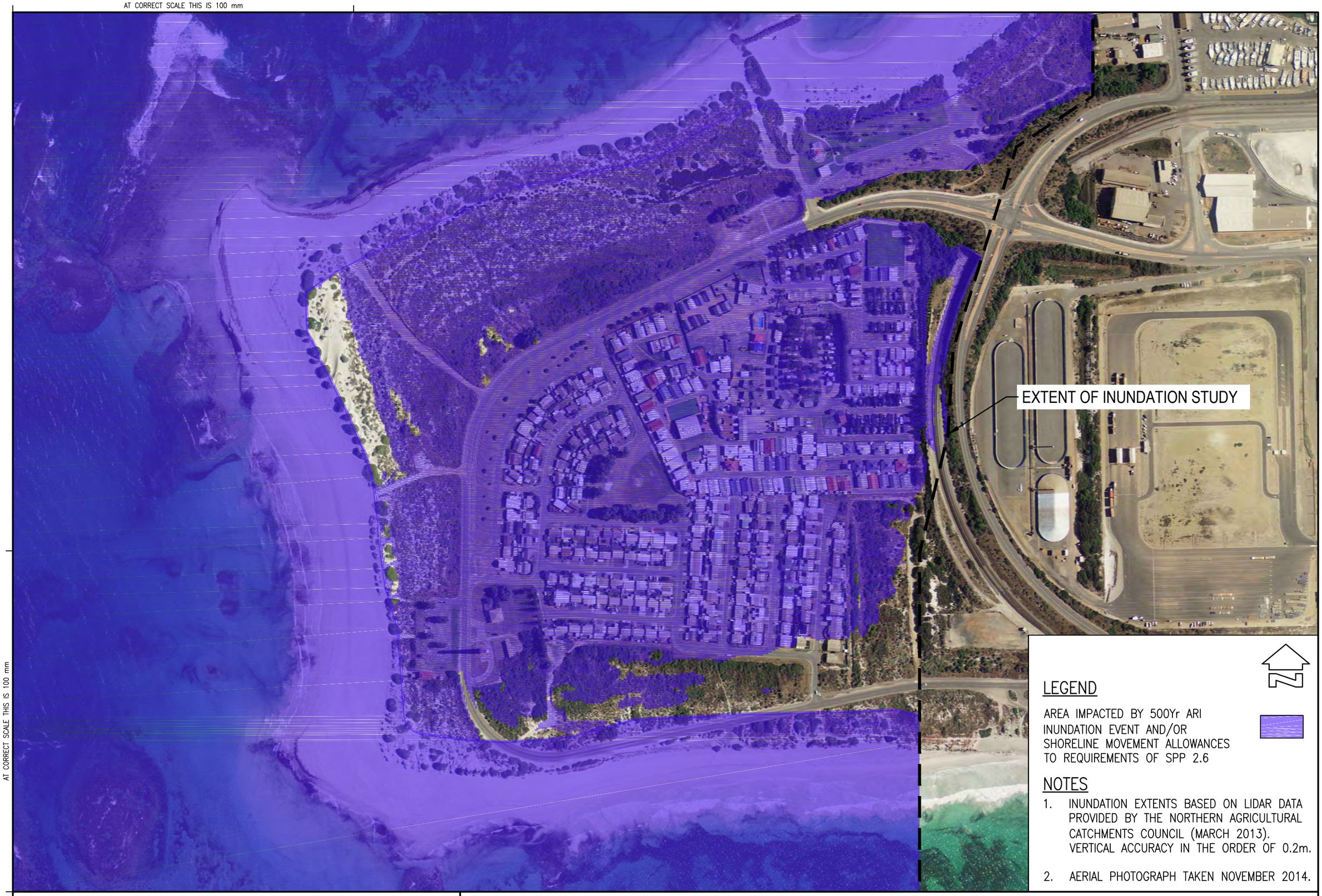

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LEGEND

AREA IMPACTED BY 500Yr ARI INUNDATION EVENT AND/OR SHORELINE MOVEMENT ALLOWANCES TO REQUIREMENTS OF SPP 2.6

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POINT MOORE COASTAL EROSION AND INUNDATION STUDY

COMBINED COASTAL VULNERABILITY MAPPING – 2030 (+0.07 SLR)

SCALE AT A3 1:4,000

DECEMBER 2015

D1242-06-02(B)

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LEGEND

AREA IMPACTED BY 500Yr ARI INUNDATION EVENT AND/OR SHORELINE MOVEMENT ALLOWANCES TO REQUIREMENTS OF SPP 2.6

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POINT MOORE COASTAL EROSION AND INUNDATION STUDY

COMBINED COASTAL VULNERABILITY MAPPING – 2070 (+0.39 SLR)

SCALE AT A3 1:4,000

DECEMBER 2015

D1242-06-03(B)

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LEGEND

AREA IMPACTED BY 500Yr ARI INUNDATION EVENT AND/OR SHORELINE MOVEMENT ALLOWANCES TO REQUIREMENTS OF SPP 2.6

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POINT MOORE COASTAL EROSION AND INUNDATION STUDY

COMBINED COASTAL VULNERABILITY MAPPING – 2110 (+0.9 SLR)

SCALE AT A3 1:4,000

DECEMBER 2015

D1242-06-04(B)

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