

TECHNICAL PAPER

04

Hydrology and flooding impact assessment

Appendix A Existing conditions flood maps

Appendix A4 Hazard maps

NARRABRI TO NORTH STAR—PHASE 2 ENVIRONMENTAL IMPACT STATEMENT



Appendix A – Existing conditions flood maps

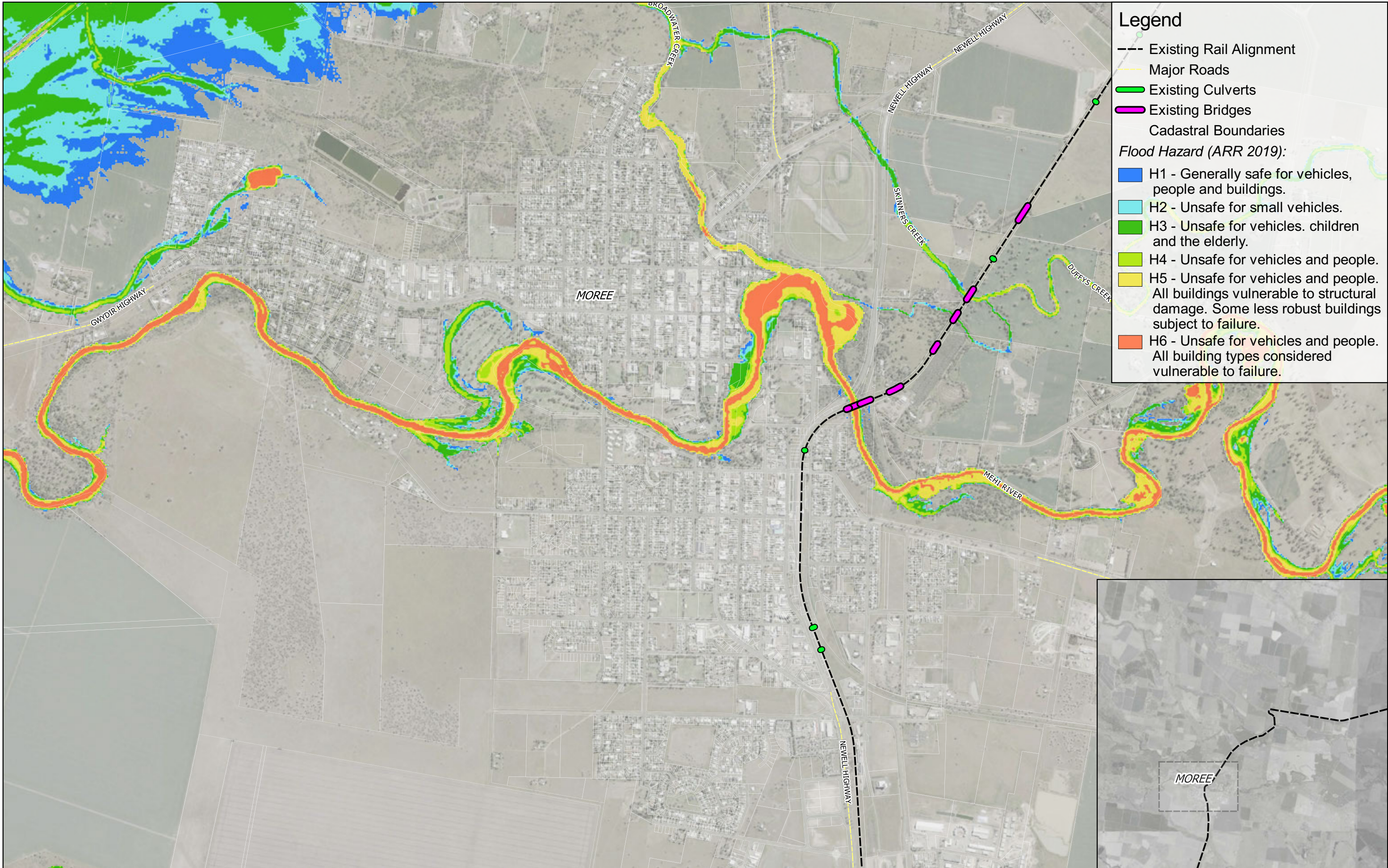
Map list

MAP SET ID	MAP CONTENTS
EX_DEP_020	Flood Depth and Level – Existing Conditions, 20% AEP Event
EX_DEP_010	Flood Depth and Level – Existing Conditions, 10% AEP Event
EX_DEP_005	Flood Depth and Level – Existing Conditions, 5% AEP Event
EX_DEP_002	Flood Depth and Level – Existing Conditions, 2% AEP Event
EX_DEP_001	Flood Depth and Level – Existing Conditions, 1% AEP Event
EX_DEP_001CC	Flood Depth and Level – Existing Conditions, 1% AEP Event with Climate Change
EX_DEP_PMF	Flood Depth and Level – Existing Conditions, PMF Event
EX_VEL_020	Flood Velocity – Existing Conditions, 20% AEP Event
EX_VEL_010	Flood Velocity – Existing Conditions, 10% AEP Event
EX_VEL_005	Flood Velocity – Existing Conditions, 5% AEP Event
EX_VEL_002	Flood Velocity – Existing Conditions, 2% AEP Event
EX_VEL_001	Flood Velocity – Existing Conditions, 1% AEP Event
EX_VEL_001CC	Flood Velocity – Existing Conditions, 1% AEP Event with Climate Change
EX_VEL_PMF	Flood Velocity – Existing Conditions, PMF Event
EX_DUR_020	Flood Duration – Existing Conditions, 20% AEP Event
EX_DUR_010	Flood Duration – Existing Conditions, 10% AEP Event
EX_DUR_005	Flood Duration – Existing Conditions, 5% AEP Event
EX_DUR_002	Flood Duration – Existing Conditions, 2% AEP Event
EX_DUR_001	Flood Duration – Existing Conditions, 1% AEP Event
EX_DUR_001CC	Flood Duration – Existing Conditions, 1% AEP Event with Climate Change
EX_DUR_PMF	Flood Duration – Existing Conditions, PMF Event
EX_HAZ_020	Flood Hazard Category – Existing Conditions, 20% AEP Event
EX_HAZ_010	Flood Hazard Category – Existing Conditions, 10% AEP Event
EX_HAZ_005	Flood Hazard Category – Existing Conditions, 5% AEP Event
EX_HAZ_002	Flood Hazard Category – Existing Conditions, 2% AEP Event
EX_HAZ_001	Flood Hazard Category – Existing Conditions, 1% AEP Event
EX_HAZ_001CC	Flood Hazard Category – Existing Conditions, 1% AEP Event with Climate Change
EX_HAZ_PMF	Flood Hazard Category – Existing Conditions, PMF Event

A.4 Hazard

Map list

MAP SET ID	MAP CONTENTS
EX_HAZ_020	Flood Hazard Category – Existing Conditions, 20% AEP Event
EX_HAZ_010	Flood Hazard Category – Existing Conditions, 10% AEP Event
EX_HAZ_005	Flood Hazard Category – Existing Conditions, 5% AEP Event
EX_HAZ_002	Flood Hazard Category – Existing Conditions, 2% AEP Event
EX_HAZ_001	Flood Hazard Category – Existing Conditions, 1% AEP Event
EX_HAZ_001CC	Flood Hazard Category – Existing Conditions, 1% AEP Event with Climate Change
EX_HAZ_PMF	Flood Hazard Category – Existing Conditions, PMF Event



Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

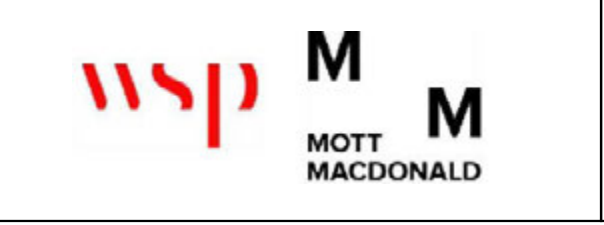
Flood Hazard (ARR 2019):

- H1 - Generally safe for vehicles, people and buildings.
- H2 - Unsafe for small vehicles.
- H3 - Unsafe for vehicles, children and the elderly.
- H4 - Unsafe for vehicles and people.
- H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust buildings subject to failure.
- H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure.



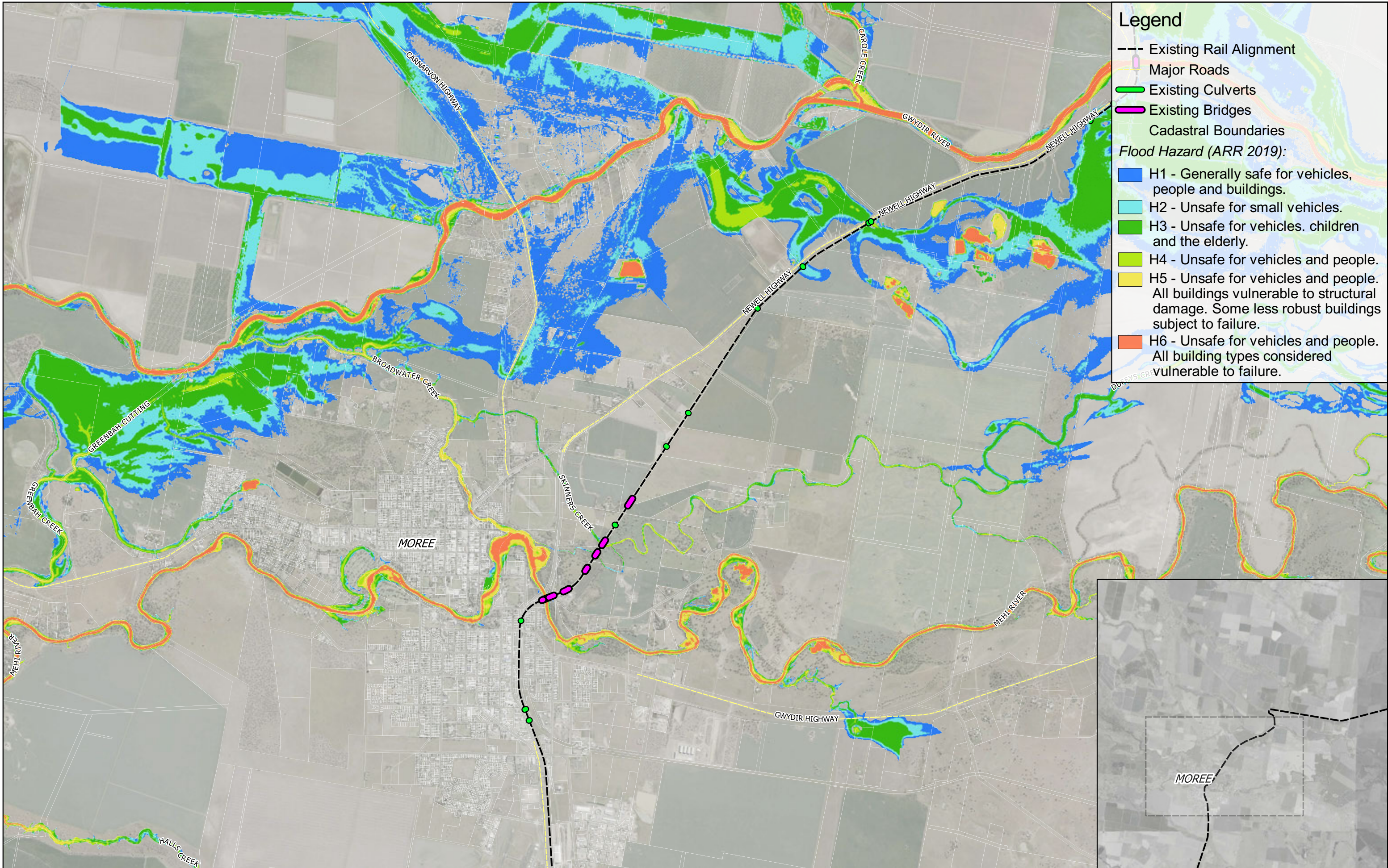
Prepared for: ARTC
 Coordinate system: GDA 1994 MGA Zone 55
 Aerial Source: NSW Six Maps
 Scale ratio correct when printed at A3

Scale: 1:20000



Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 20% AEP
 Sheet 1
 Map ID: EX_HAZ_020_1

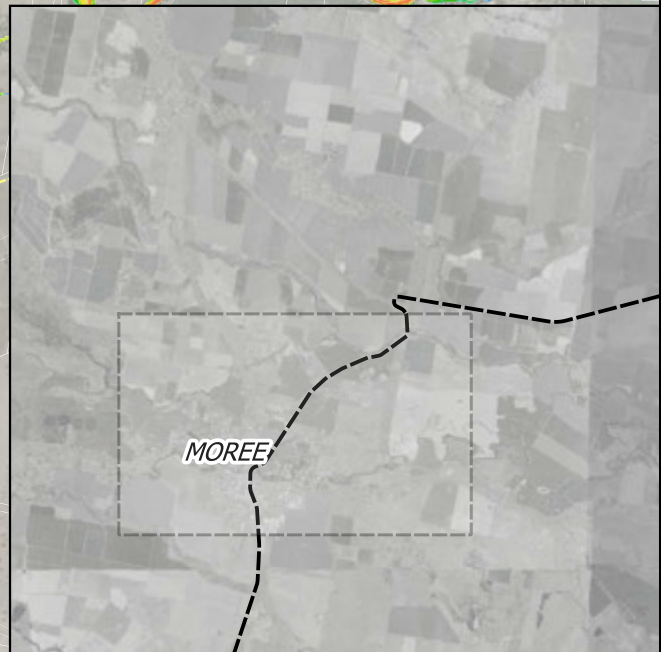


Legend

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- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

Flood Hazard (ARR 2019):

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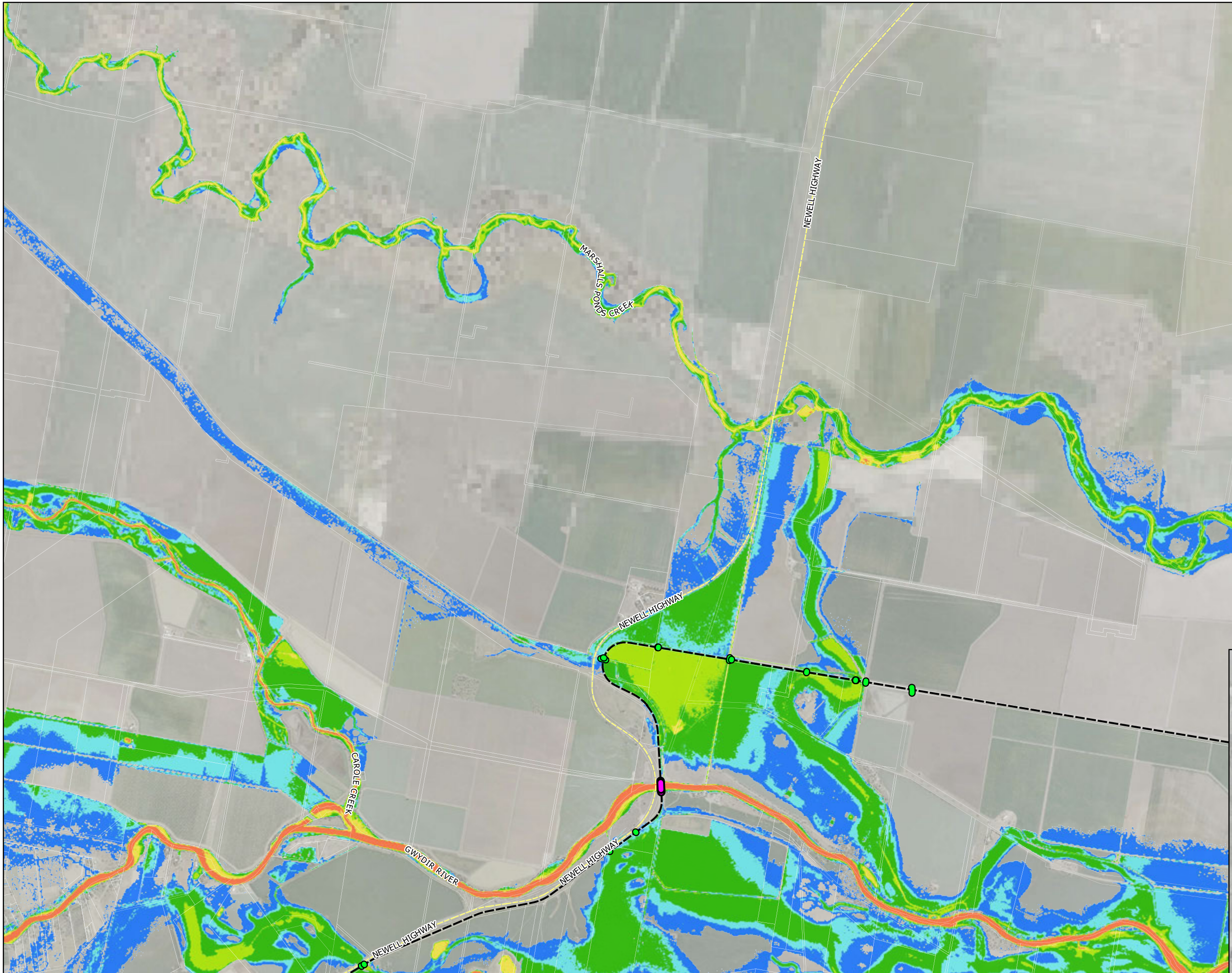
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 Aerial Source: NSW Six Maps
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Scale: 1:40000



Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 20% AEP
 Sheet 2
 Map ID: EX_HAZ_020_2



Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

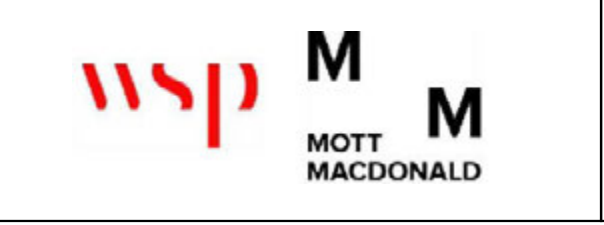
Flood Hazard (ARR 2019):

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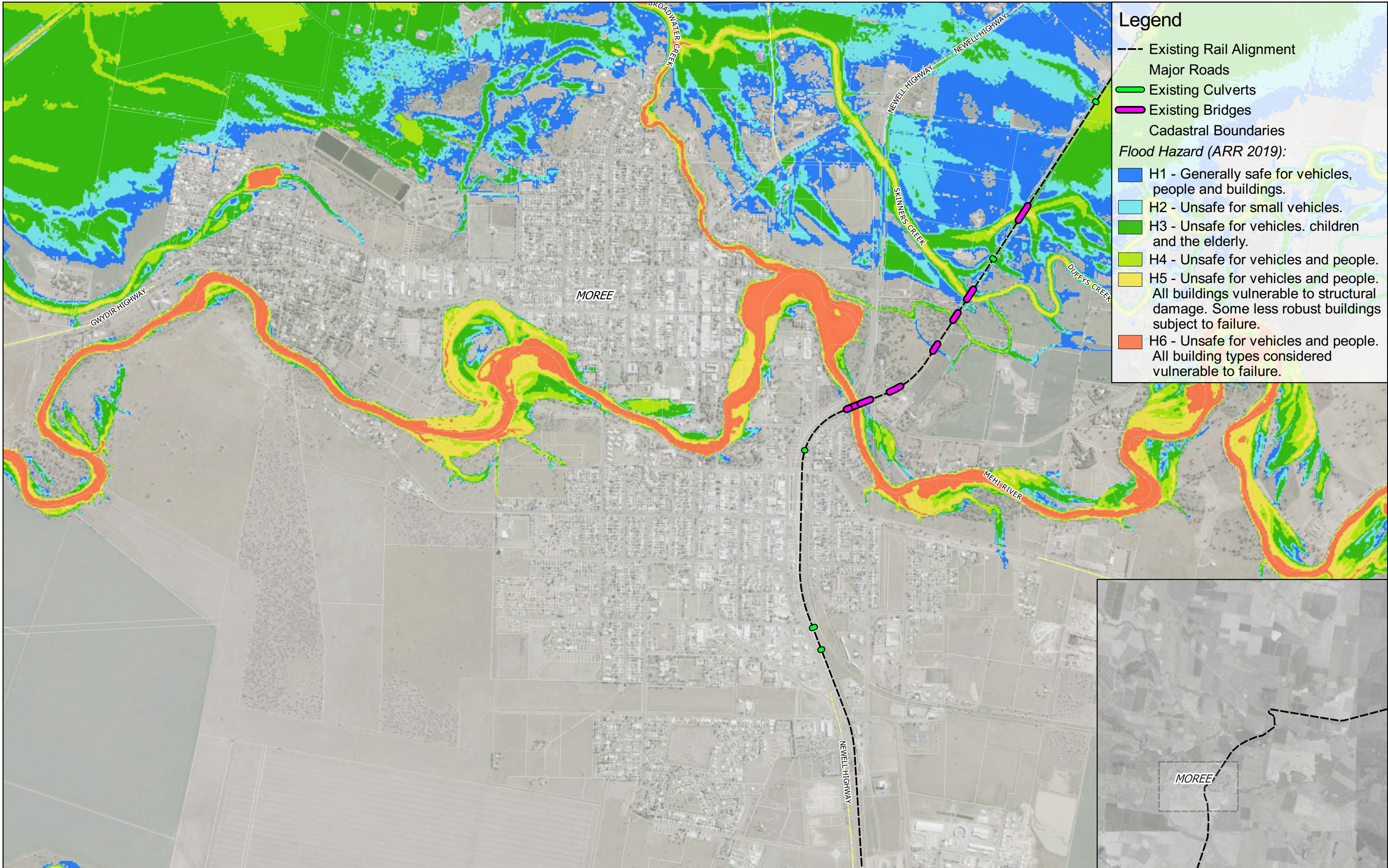
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 Aerial Source: NSW Six Maps
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Scale: 1:40000



Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 20% AEP
 Sheet 3
 Map ID: EX_HAZ_020_3



Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

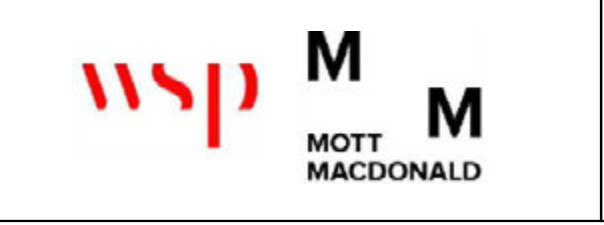
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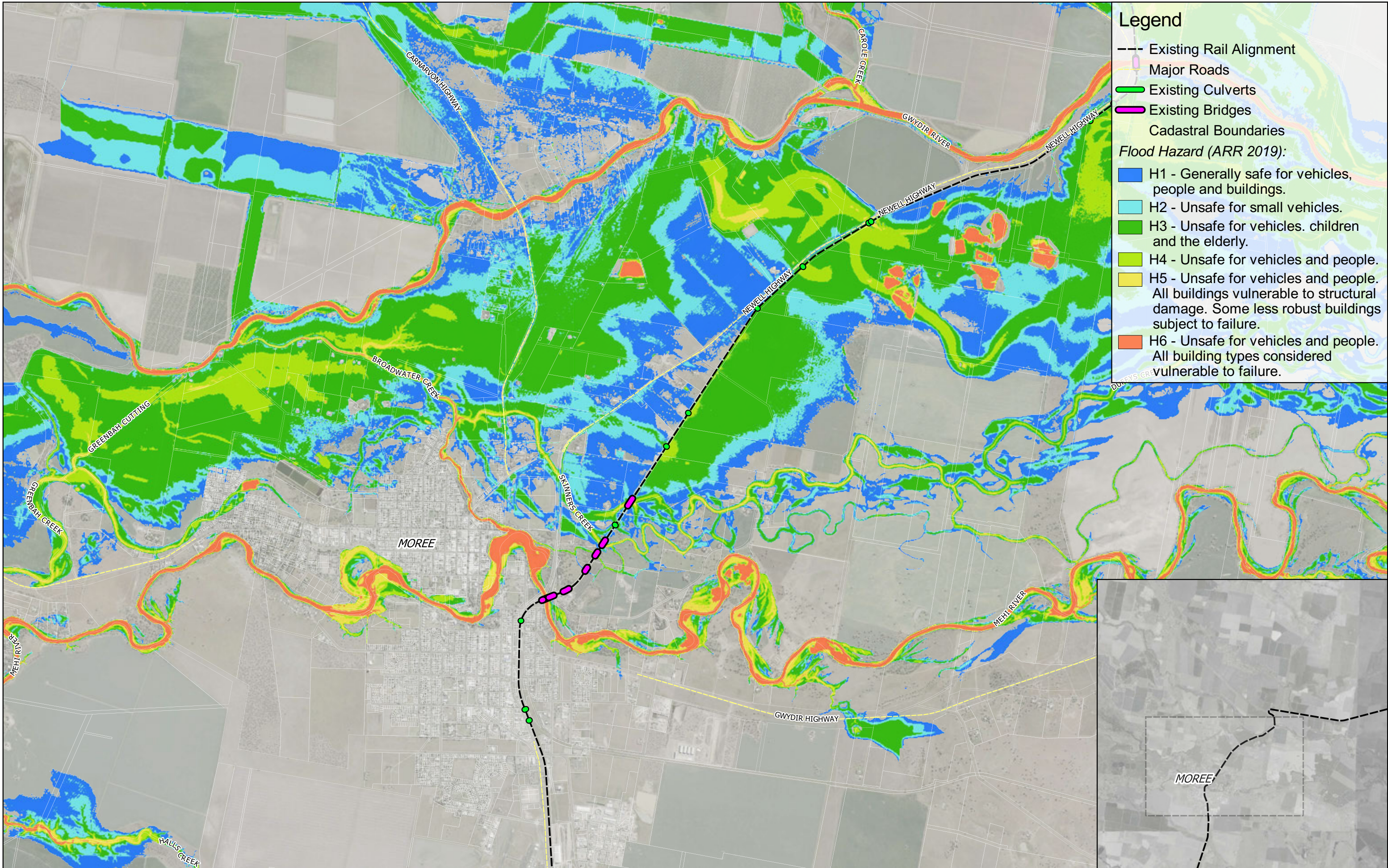
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Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 10% AEP
 Sheet 1
 Map ID: EX_HAZ_010_1



Legend

- Existing Rail Alignment
- Major Roads
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- Existing Bridges
- Cadastral Boundaries

Flood Hazard (ARR 2019):

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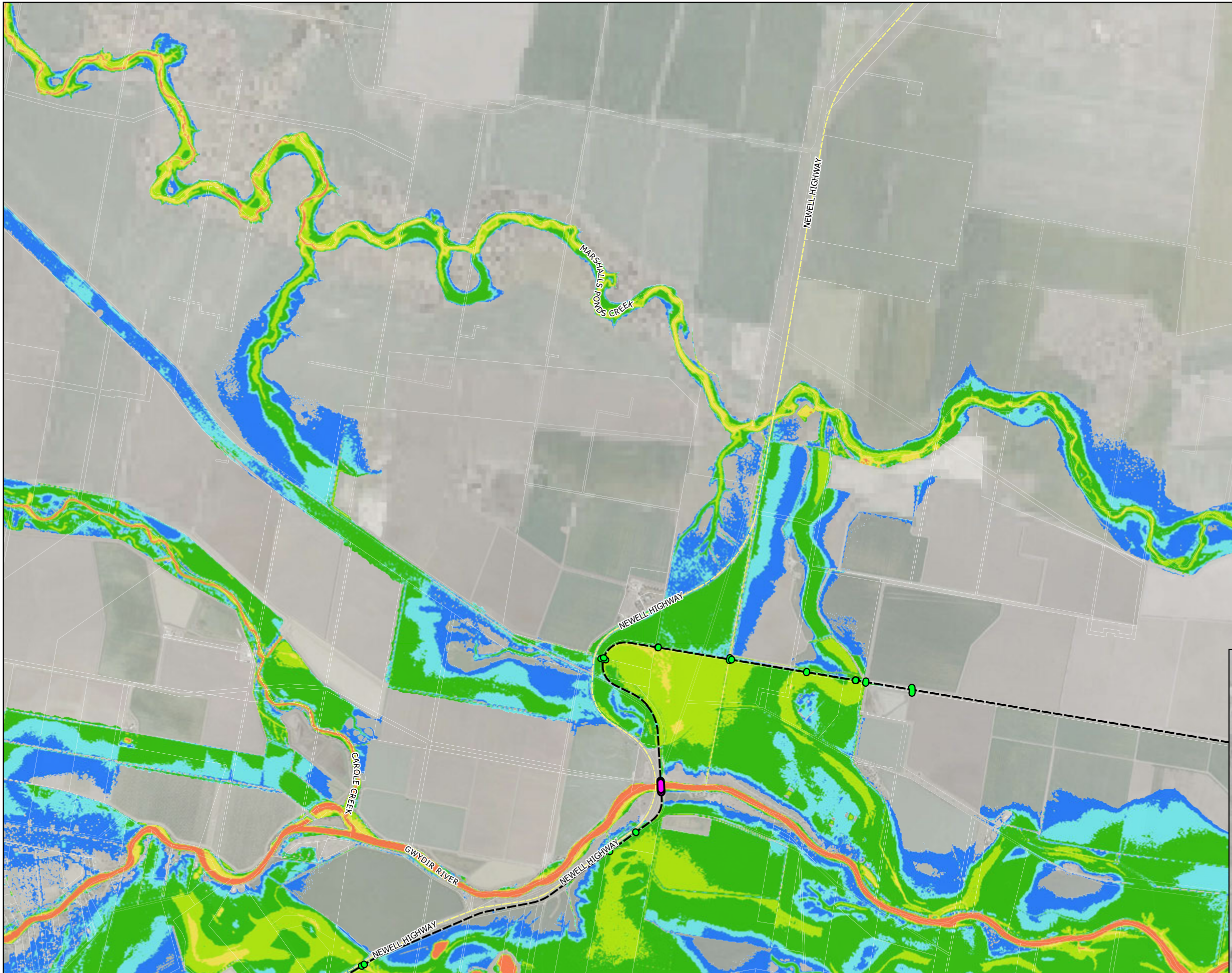


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Scale: 1:40000

Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 10% AEP
 Sheet 2
 Map ID: EX_HAZ_010_2

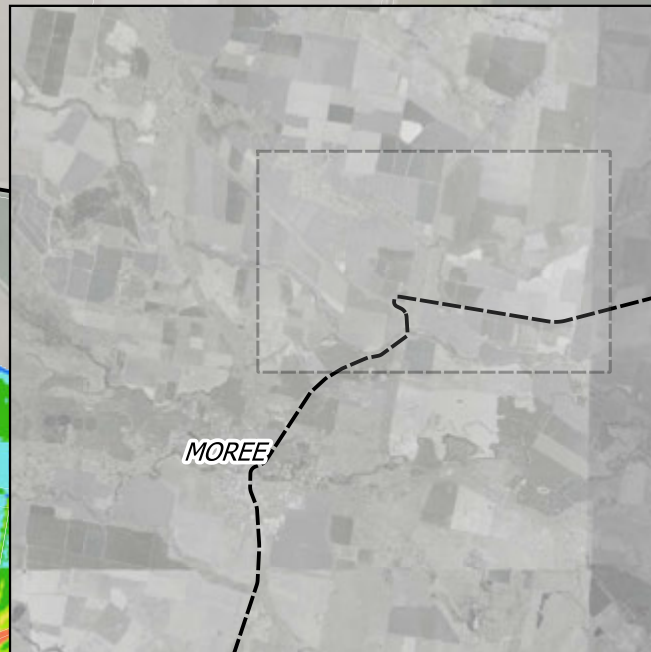


Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

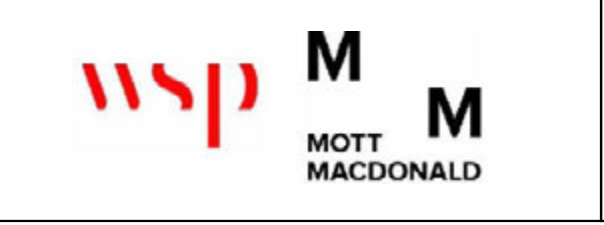
Flood Hazard (ARR 2019):

- H1 - Generally safe for vehicles, people and buildings.
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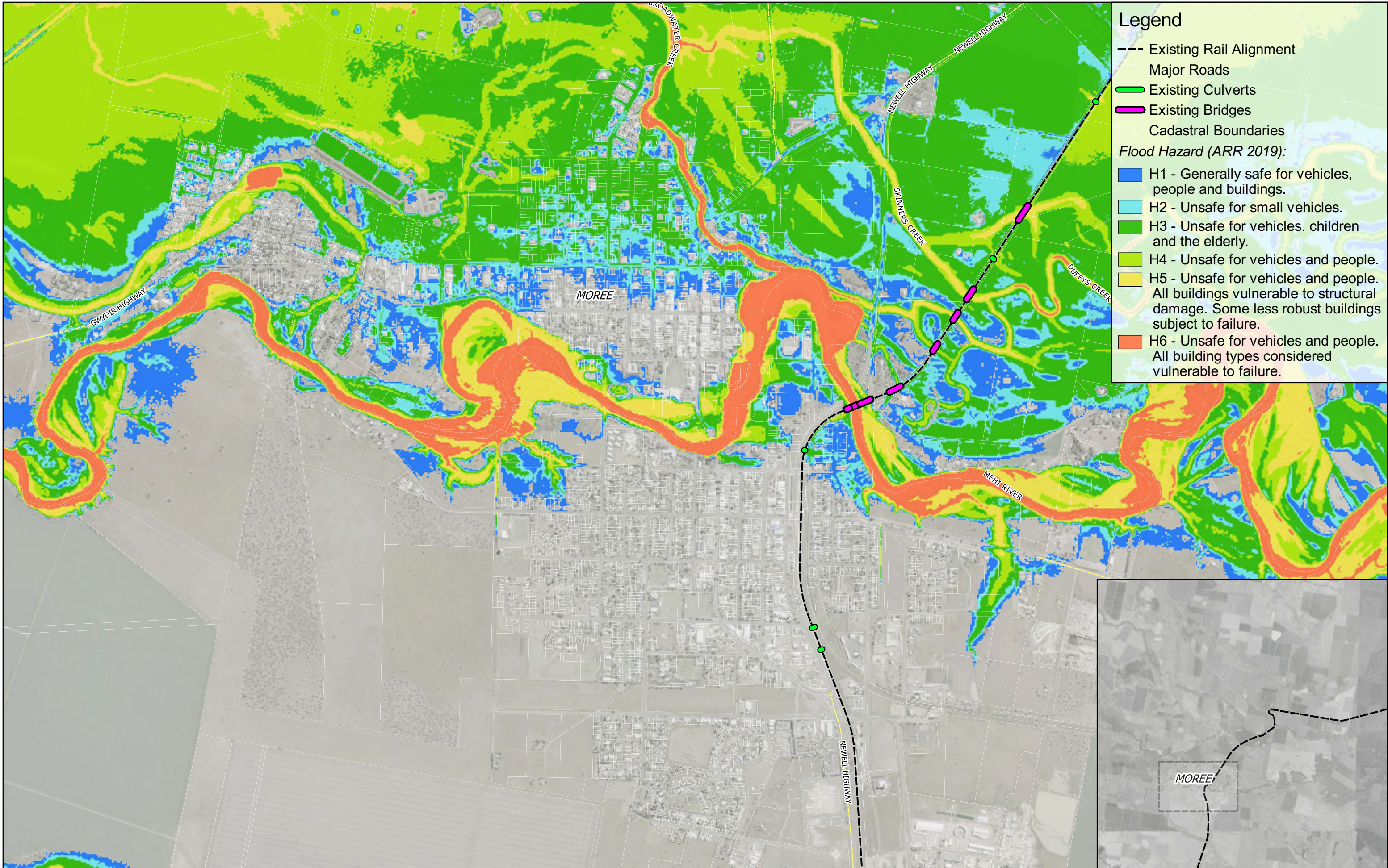
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Scale: 1:40000



Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 10% AEP
 Sheet 3
 Map ID: EX_HAZ_010_3



Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

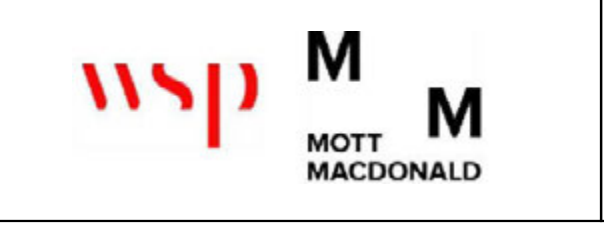
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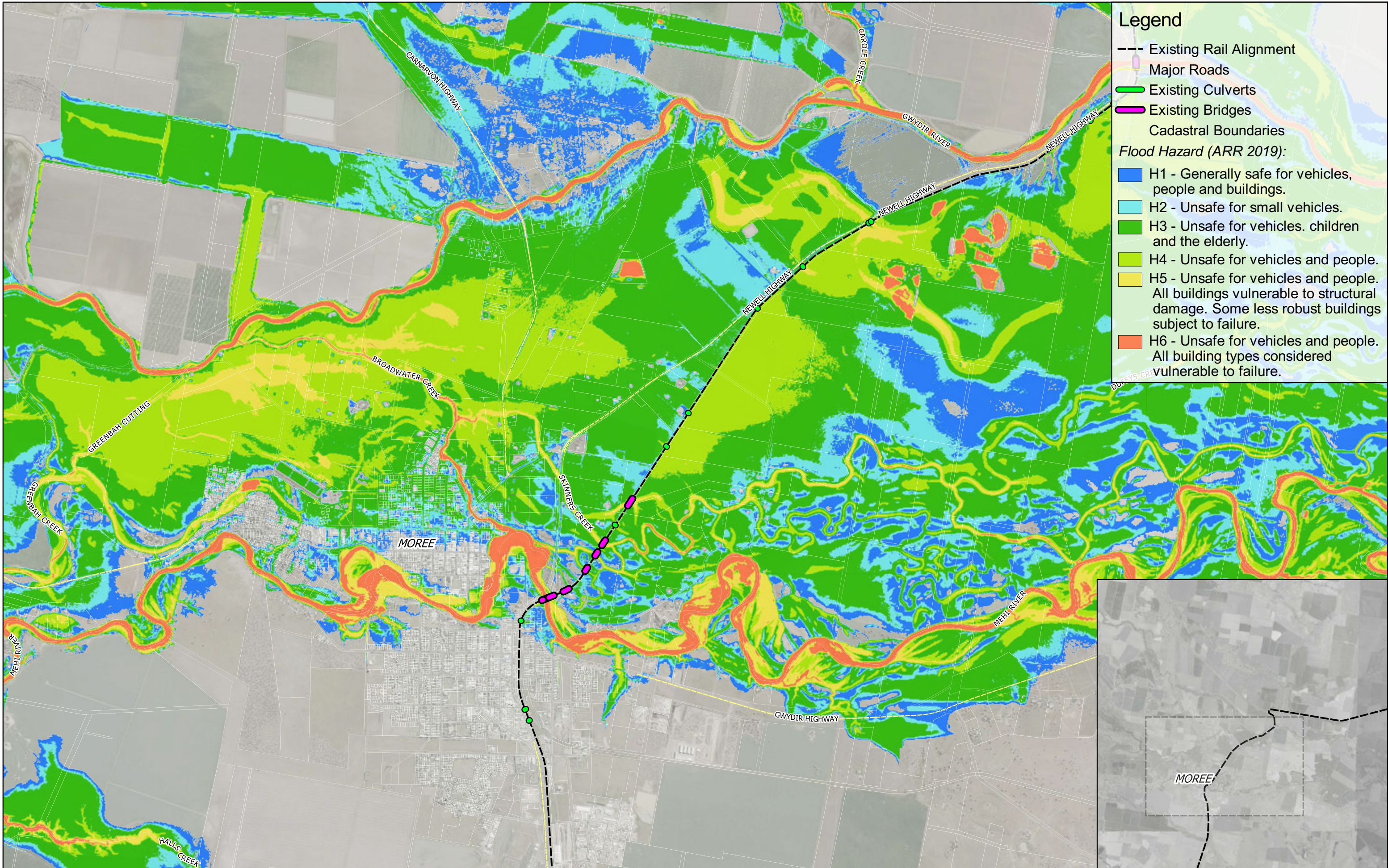
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Scale: 1:20000



Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 5% AEP
 Sheet 1
 Map ID: EX_HAZ_005_1

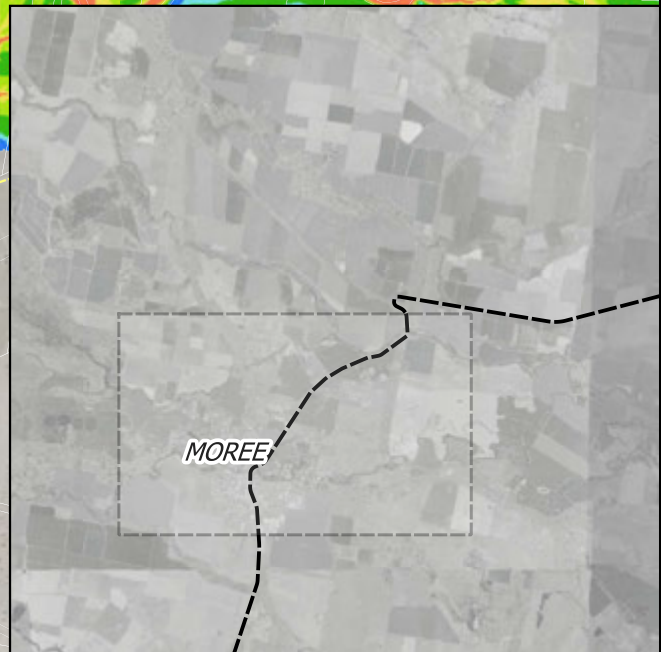


Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

Flood Hazard (ARR 2019):

- H1 - Generally safe for vehicles, people and buildings.
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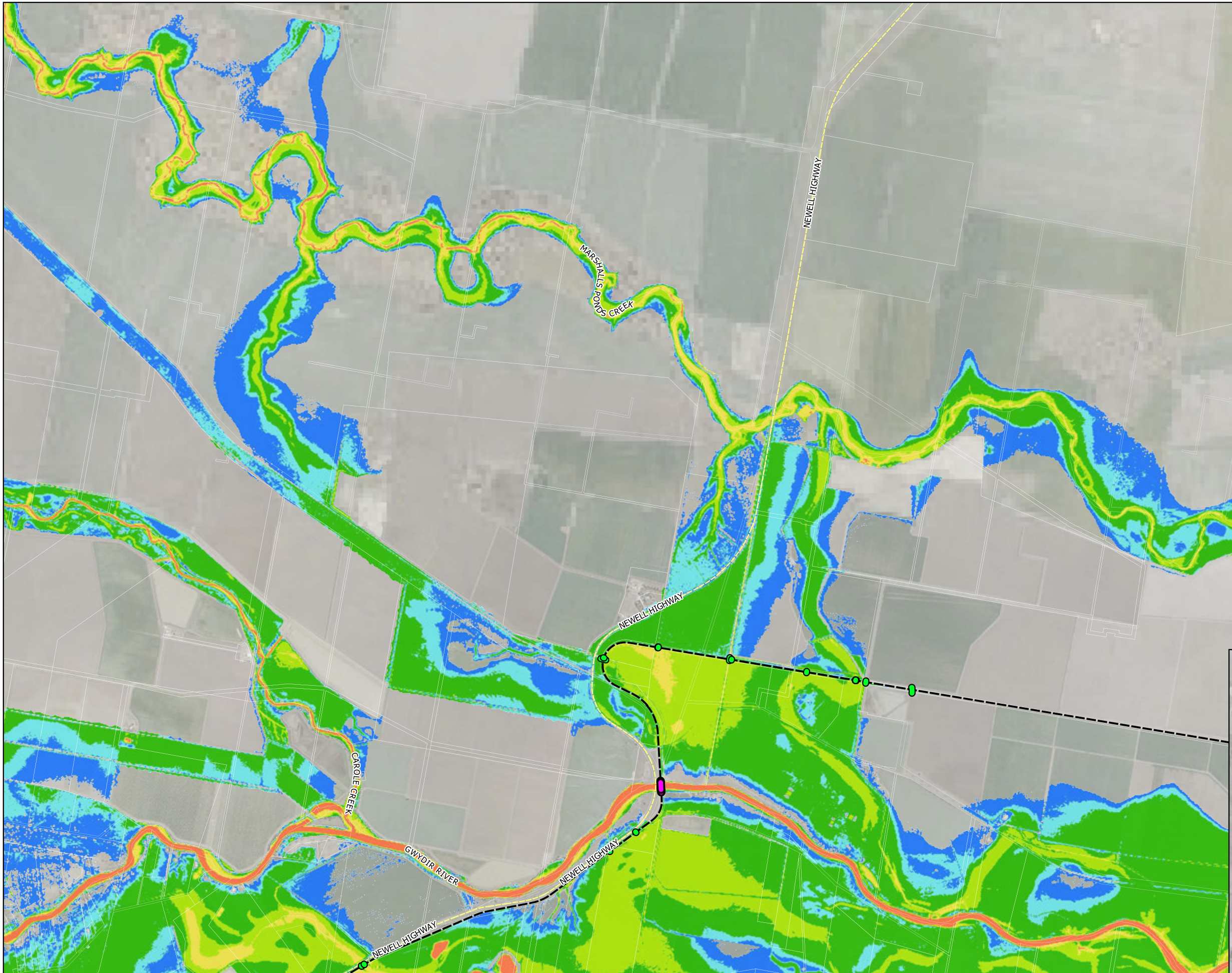


Prepared for: ARTC
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 Aerial Source: NSW Six Maps
 Scale ratio correct when printed at A3

Scale: 1:40000

Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 5% AEP
 Sheet 2
 Map ID: EX_HAZ_005_2

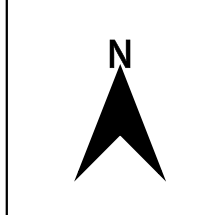
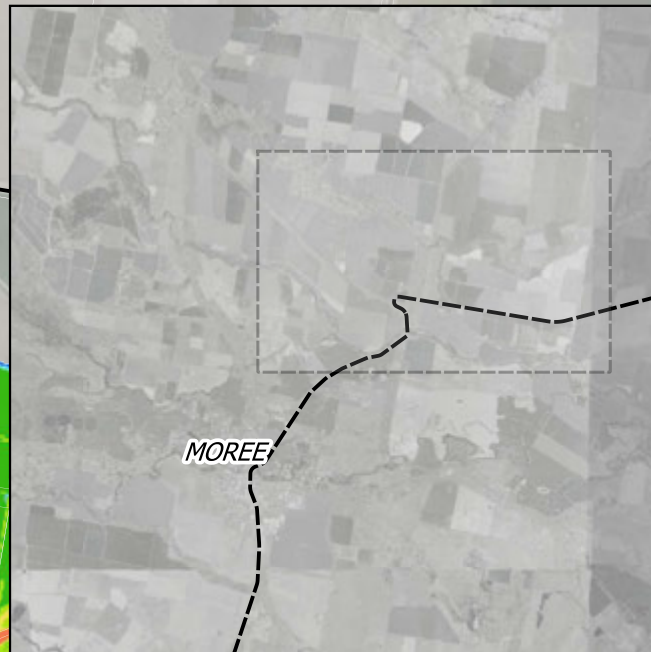


Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

Flood Hazard (ARR 2019):

- H1 - Generally safe for vehicles, people and buildings.
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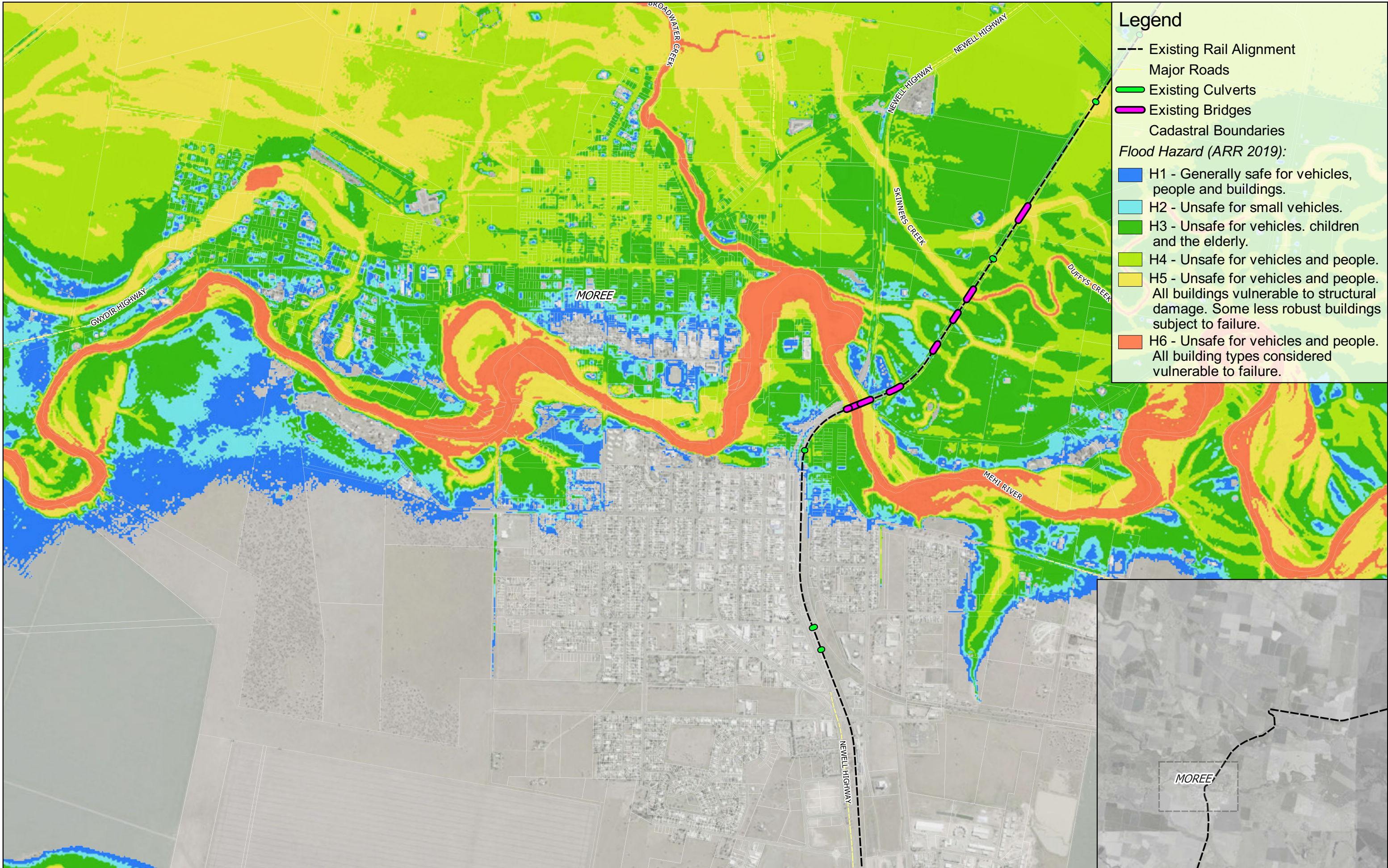
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 Aerial Source: NSW Six Maps
 Scale ratio correct when printed at A3

Scale: 1:40000



Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 5% AEP
 Sheet 3
 Map ID: EX_HAZ_005_3



Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

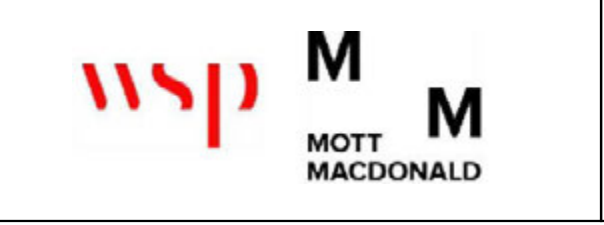
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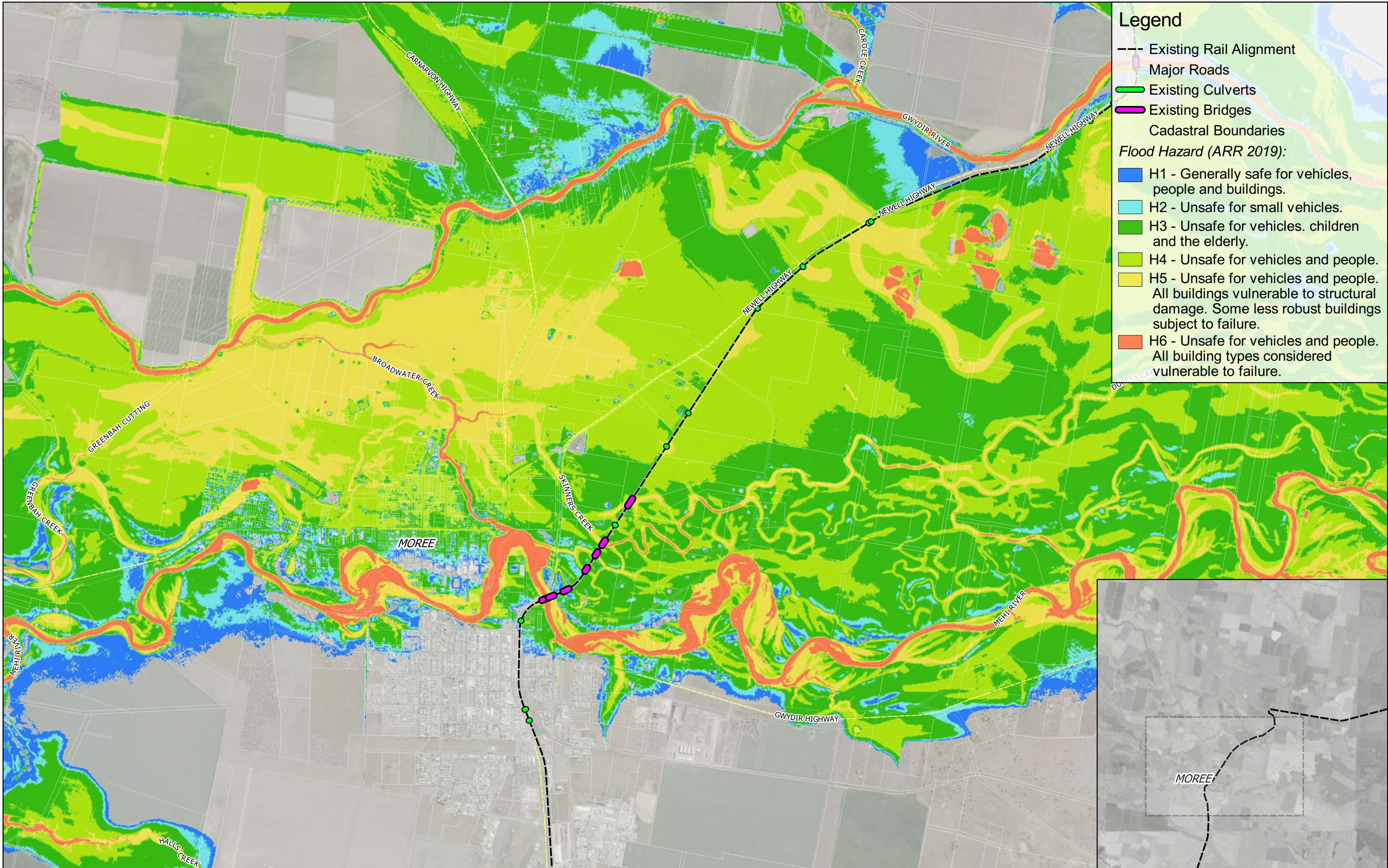
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 Aerial Source: NSW Six Maps
 Scale ratio correct when printed at A3

Scale: 1:20000



Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 2% AEP
 Sheet 1
 Map ID: EX_HAZ_002_1

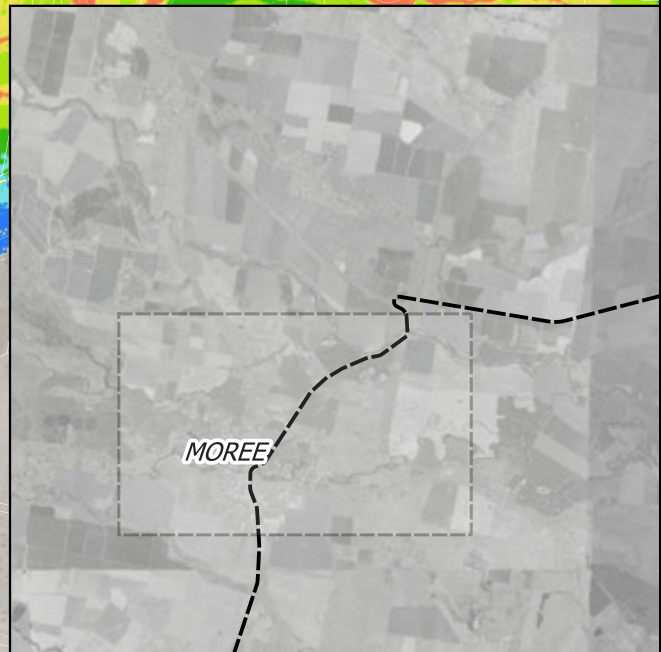


Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

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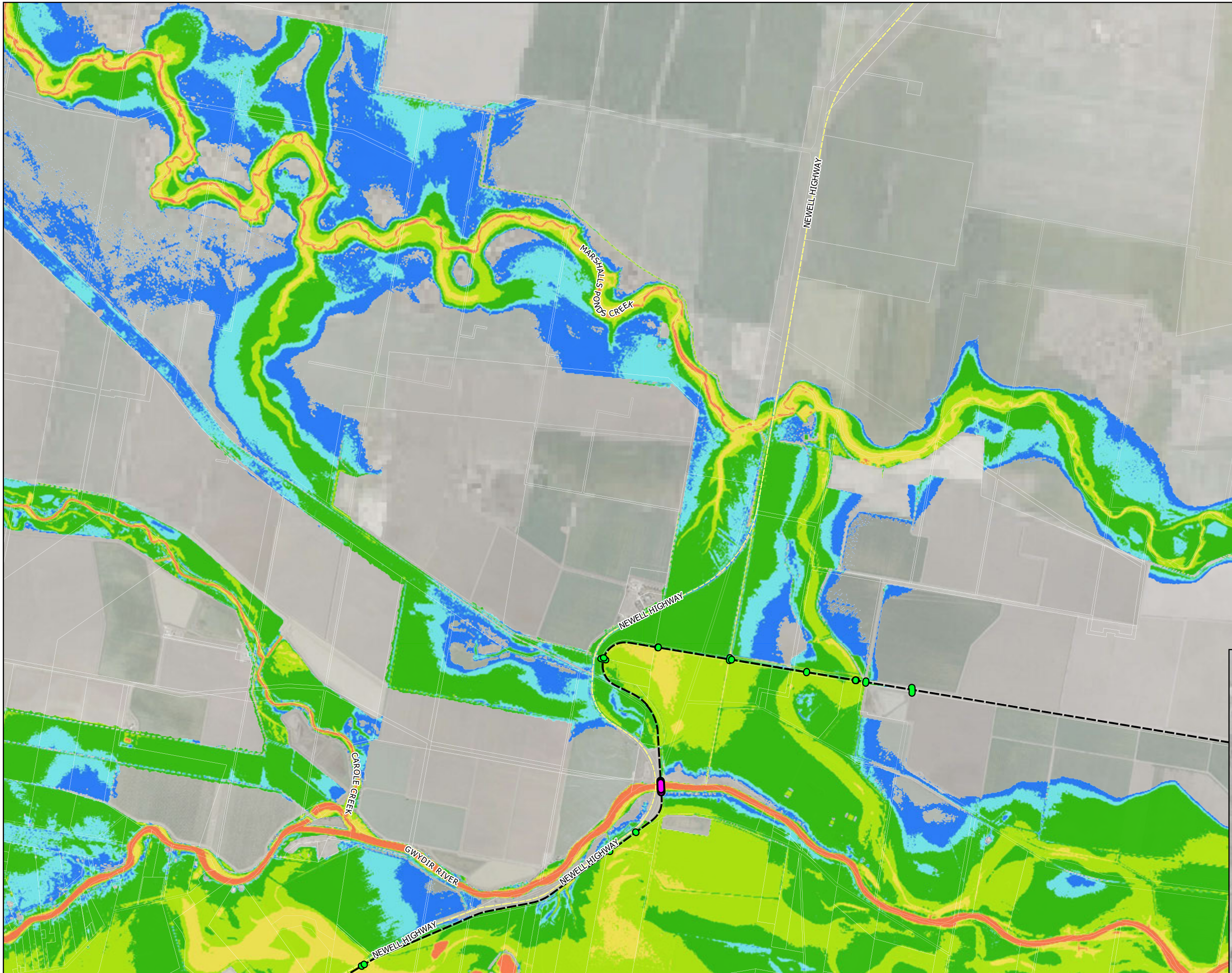
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 Aerial Source: NSW Six Maps
 Scale ratio correct when printed at A3

Scale: 1:40000



Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 2% AEP
 Sheet 2
 Map ID: EX_HAZ_002_2

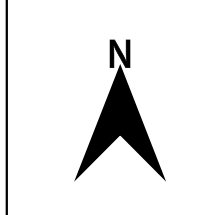
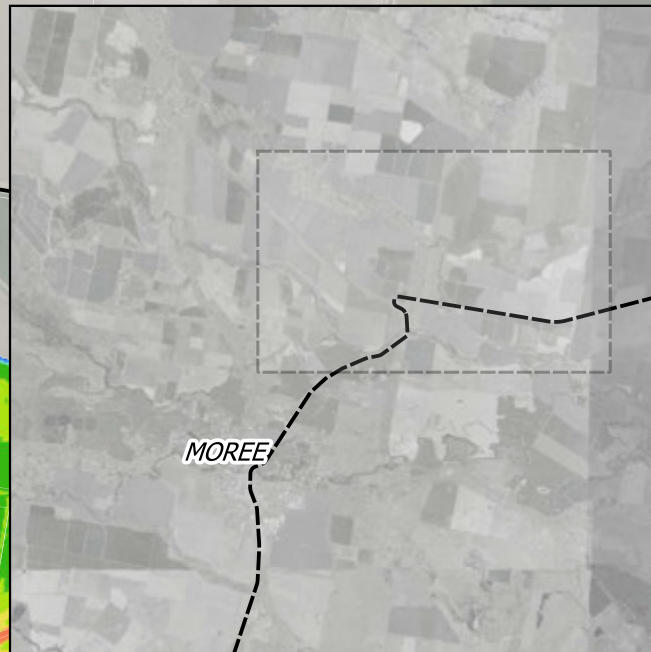


Legend

- Existing Rail Alignment
- Major Roads
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- Existing Bridges
- Cadastral Boundaries

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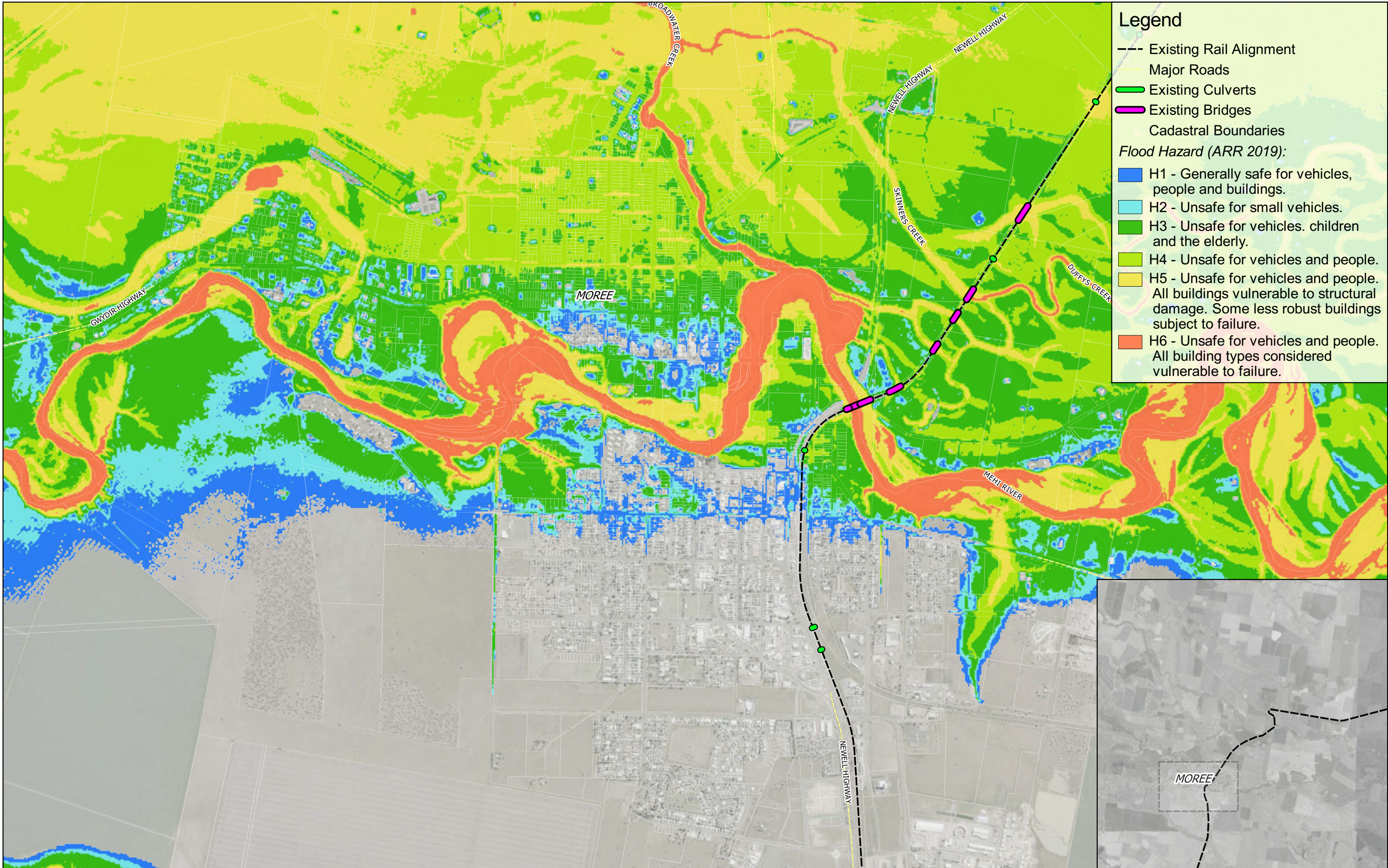
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Scale: 1:40000



Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 2% AEP
 Sheet 3
 Map ID: EX_HAZ_002_3



Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

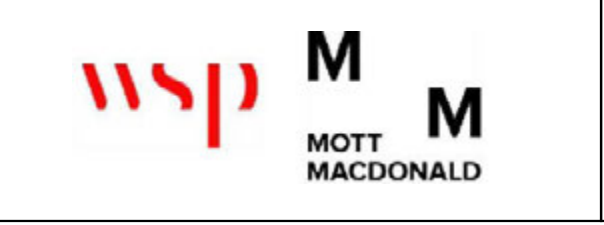
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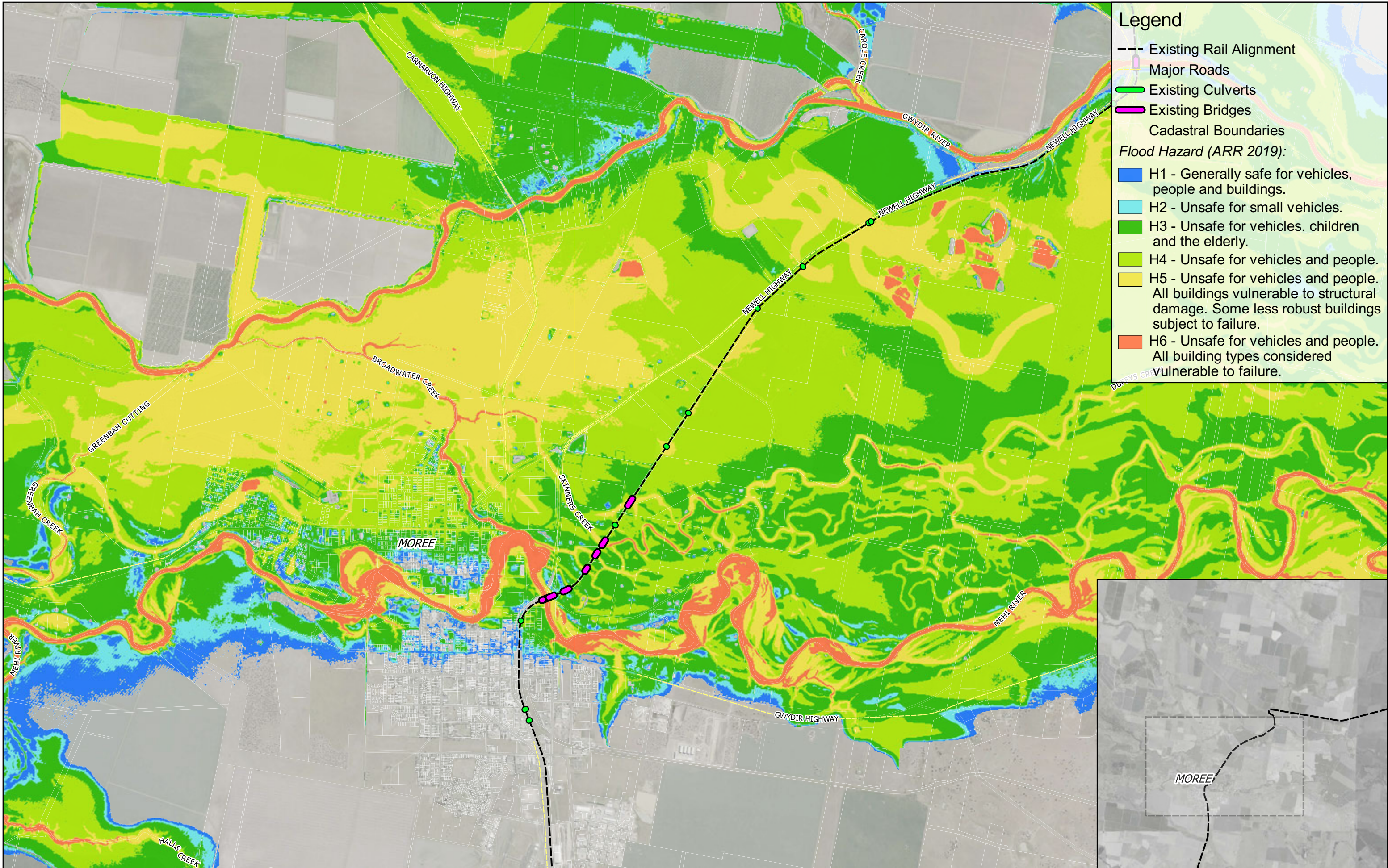
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Scale: 1:20000



Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 1% AEP
 Sheet 1
 Map ID: EX_HAZ_001_1

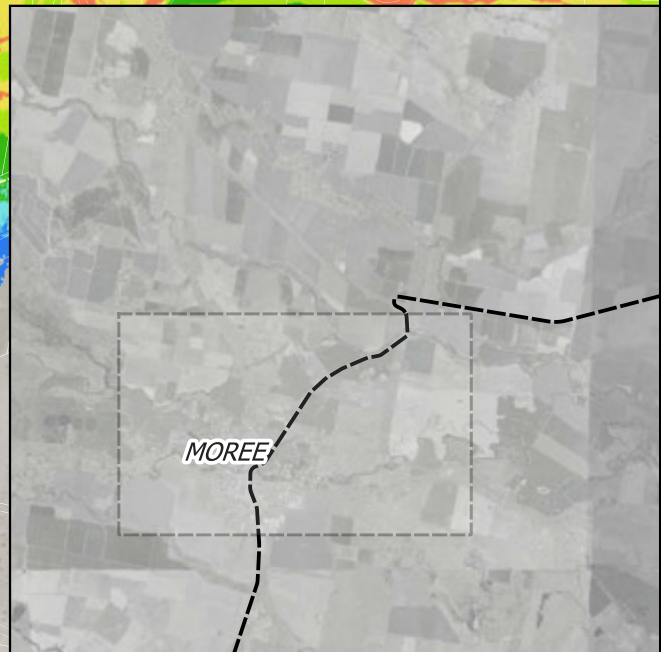


Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

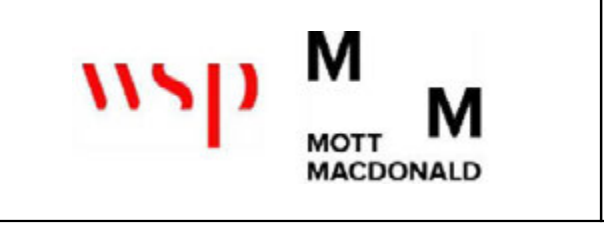
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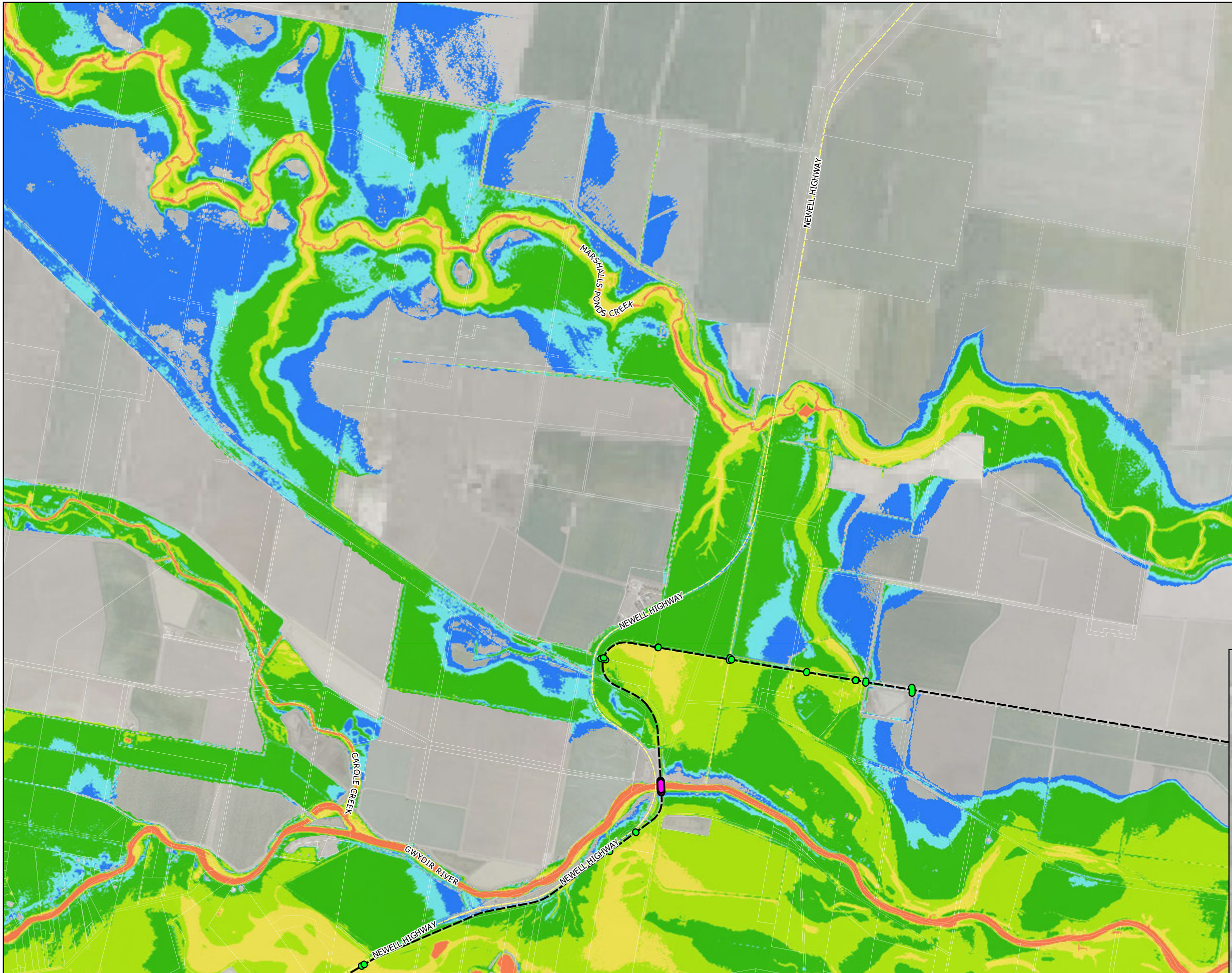
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Scale: 1:40000



Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 1% AEP
 Sheet 2
 Map ID: EX_HAZ_001_2

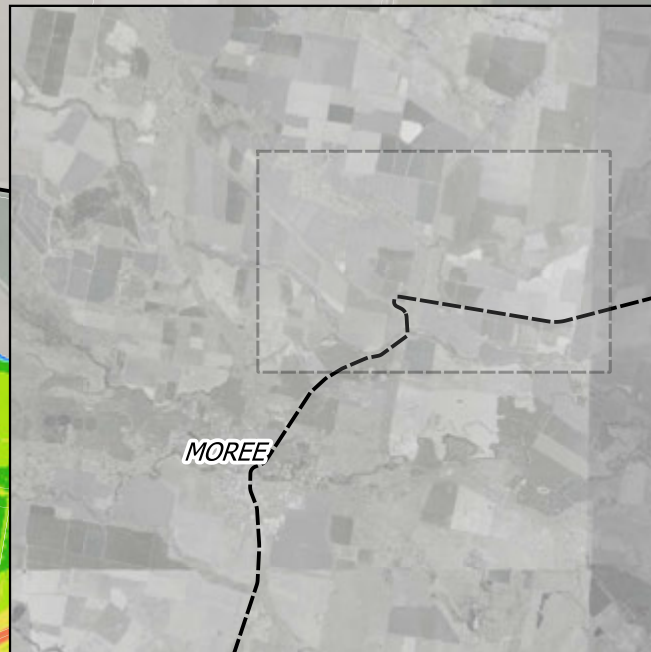


Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

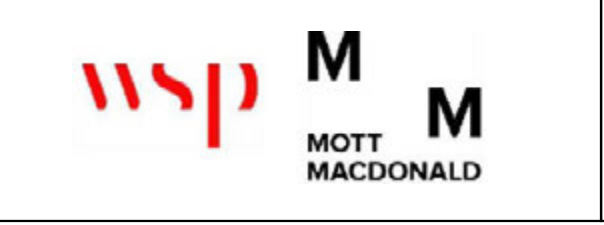
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- H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure.



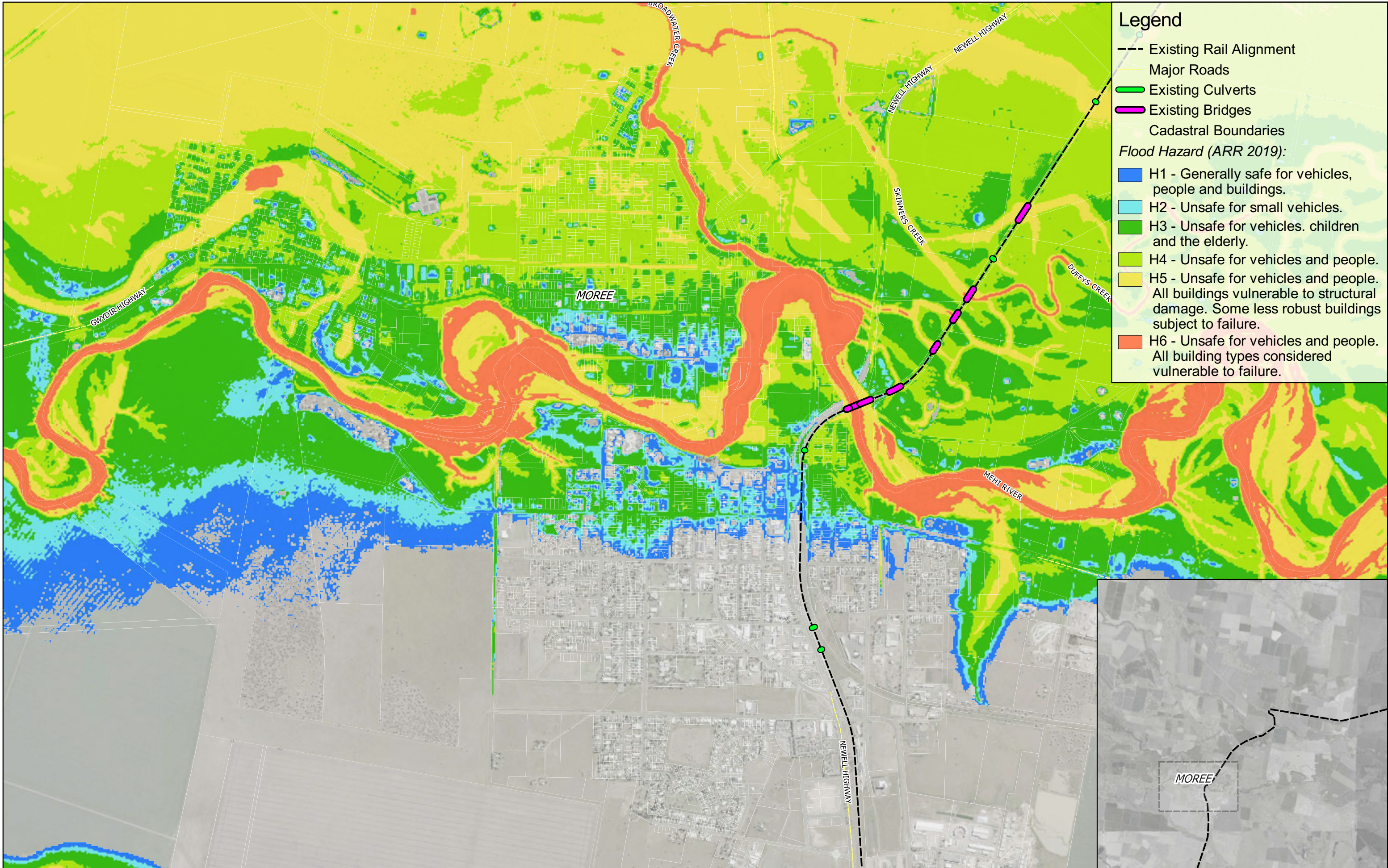
Prepared for: ARTC
 Coordinate system: GDA 1994 MGA Zone 55
 Aerial Source: NSW Six Maps
 Scale ratio correct when printed at A3

Scale: 1:40000



Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 1% AEP
 Sheet 3
 Map ID: EX_HAZ_001_3

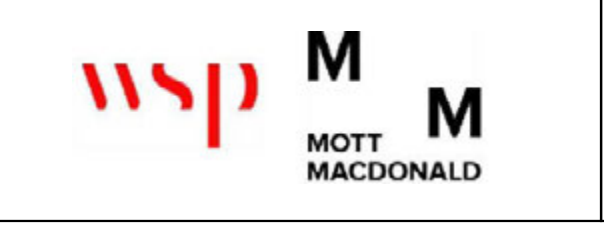


Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries
- Flood Hazard (ARR 2019):**
- H1 - Generally safe for vehicles, people and buildings.
- H2 - Unsafe for small vehicles.
- H3 - Unsafe for vehicles, children and the elderly.
- H4 - Unsafe for vehicles and people.
- H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust buildings subject to failure.
- H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure.

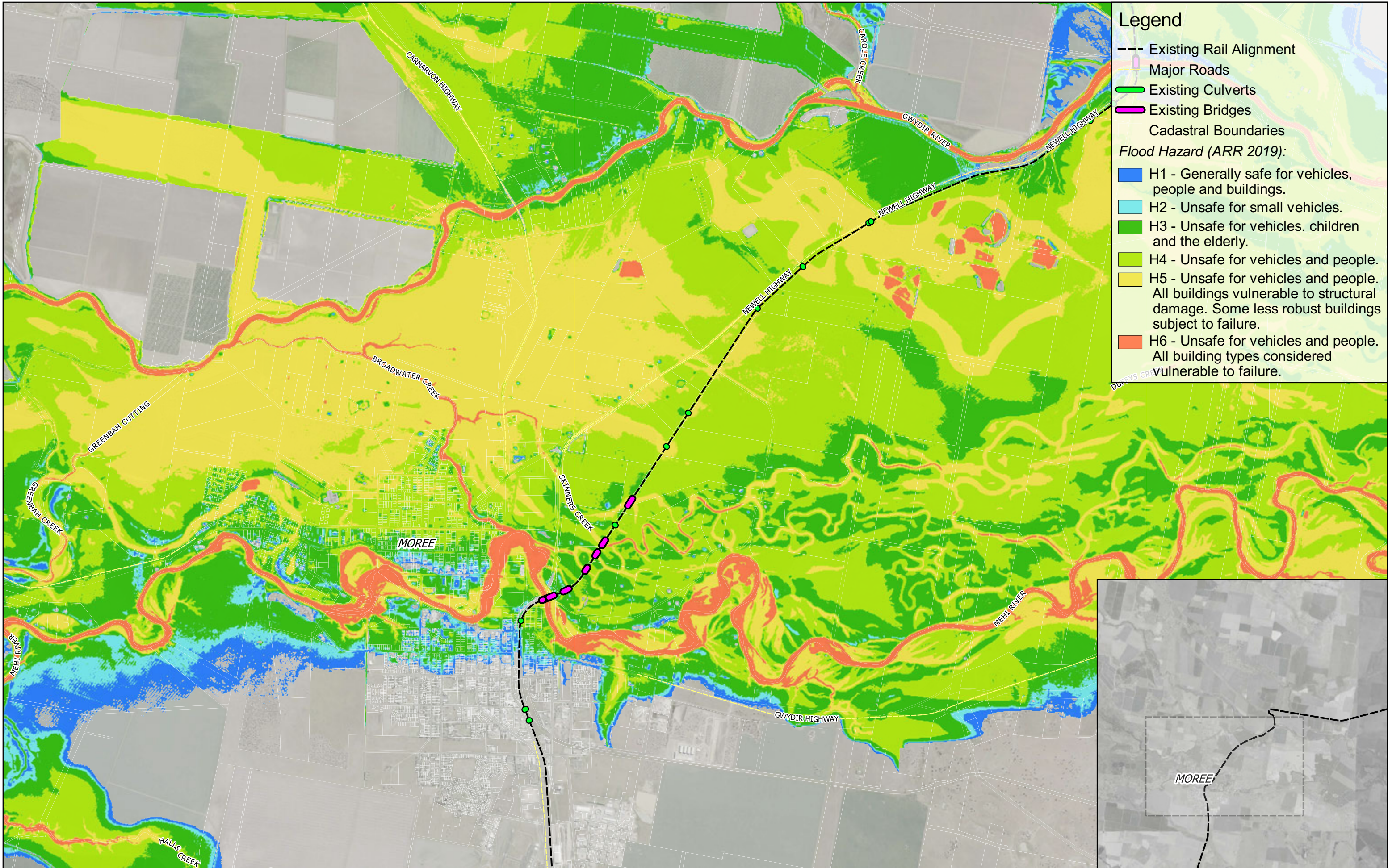
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Scale: 1:20000



Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 1% AEP Climate Change
 Sheet 1
 Map ID: EX_HAZ_001CC_1

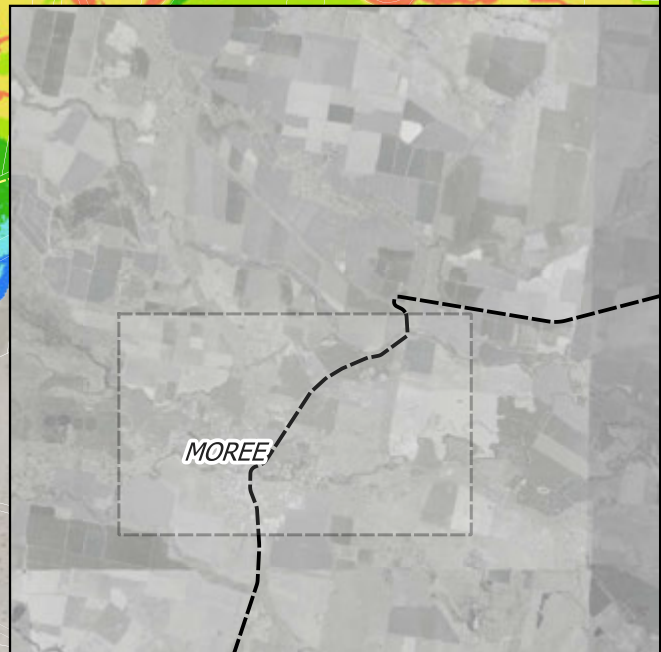


Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

Flood Hazard (ARR 2019):

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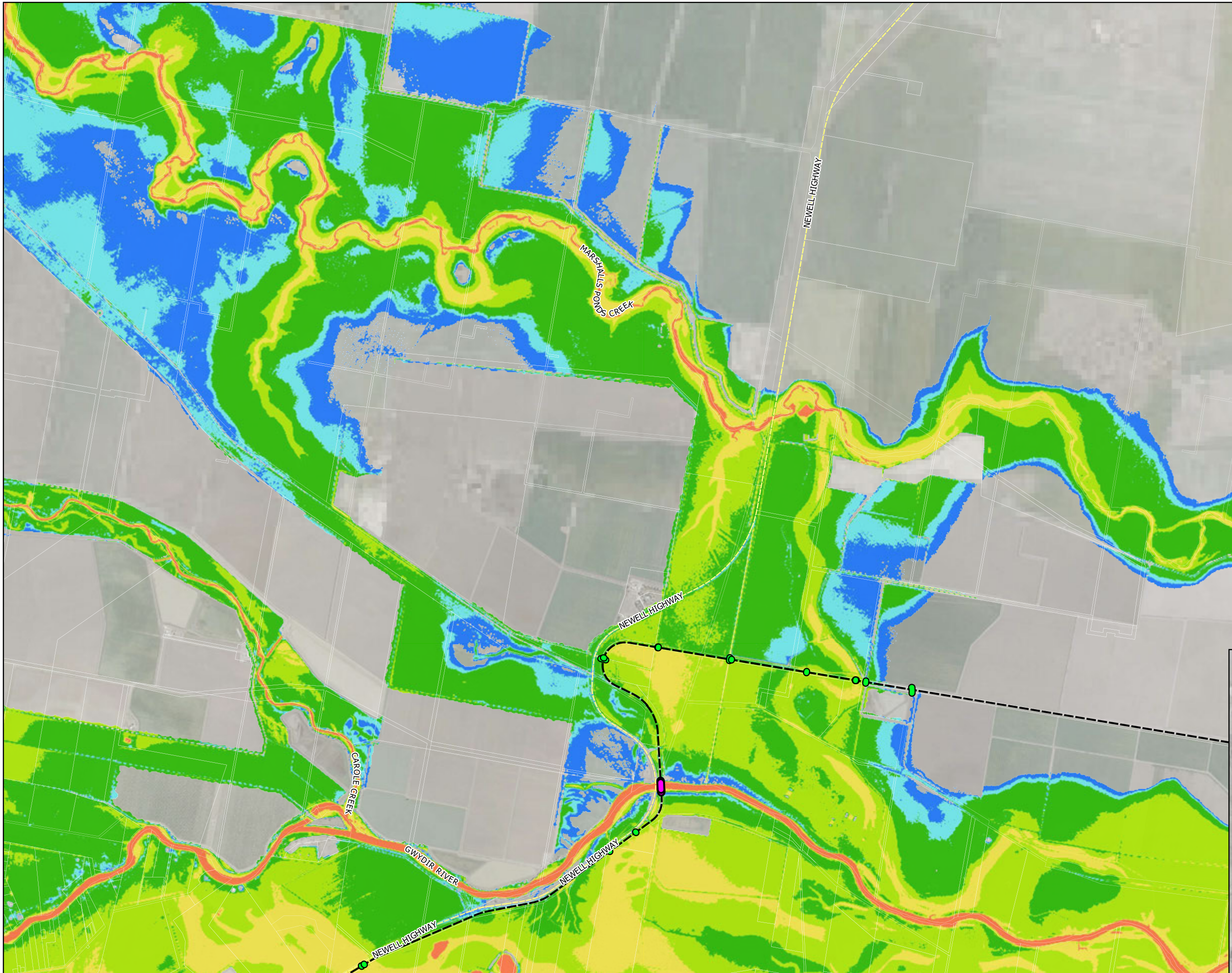


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Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 1% AEP Climate Change
 Sheet 2
 Map ID: EX_HAZ_001CC_2

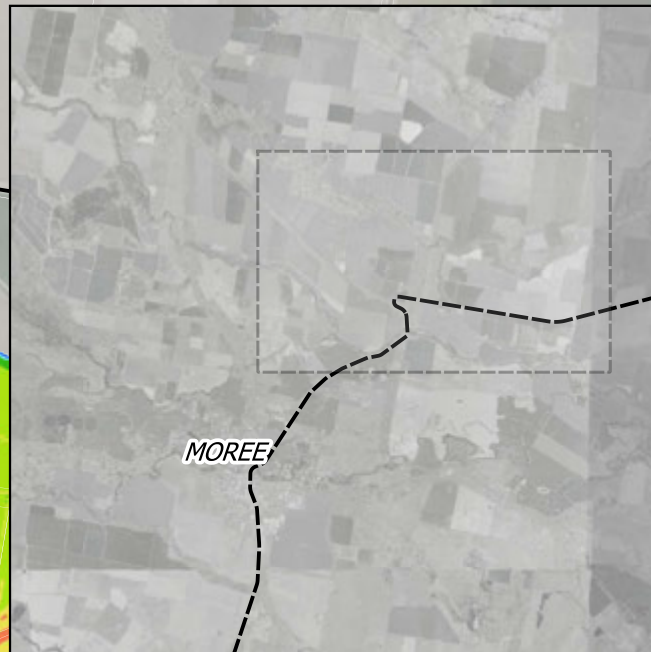


Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

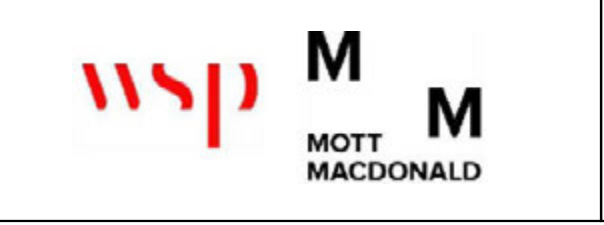
Flood Hazard (ARR 2019):

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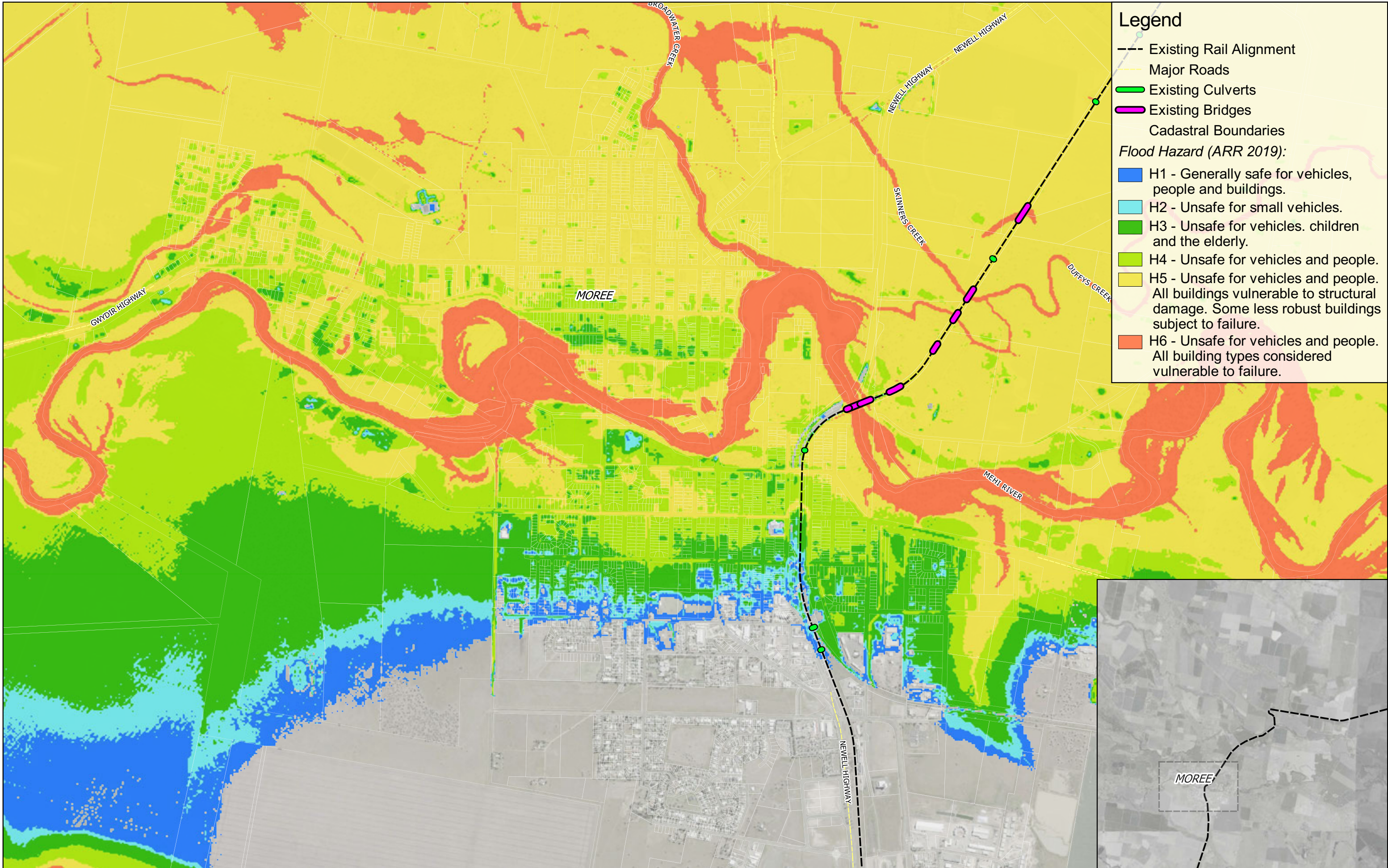
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Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: 1% AEP Climate Change
 Sheet 3
 Map ID: EX_HAZ_001CC_3




Legend



- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

Flood Hazard (ARR 2019):

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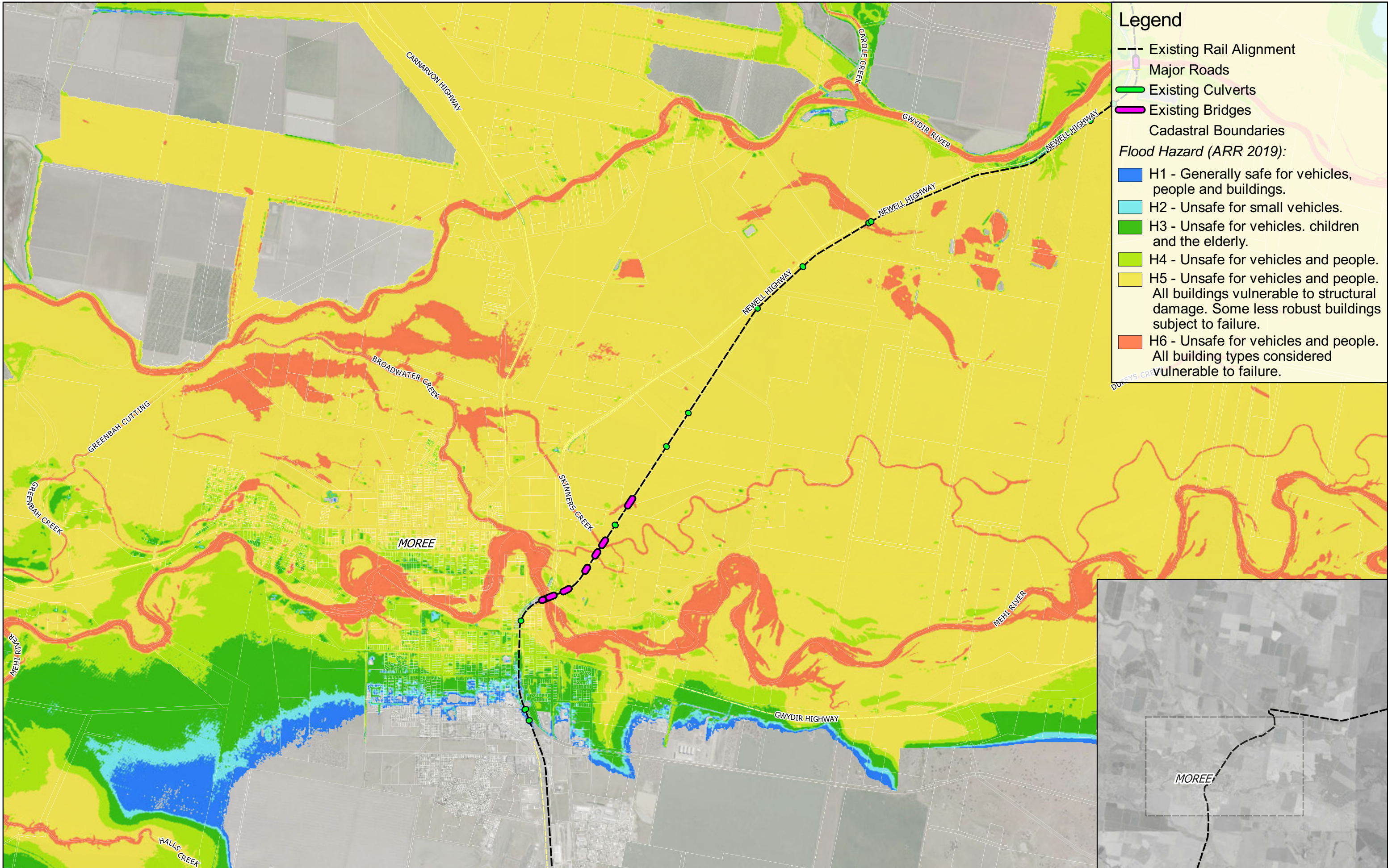



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Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: PMF
 Sheet 1
 Map ID: EX_HAZ_PMF_1

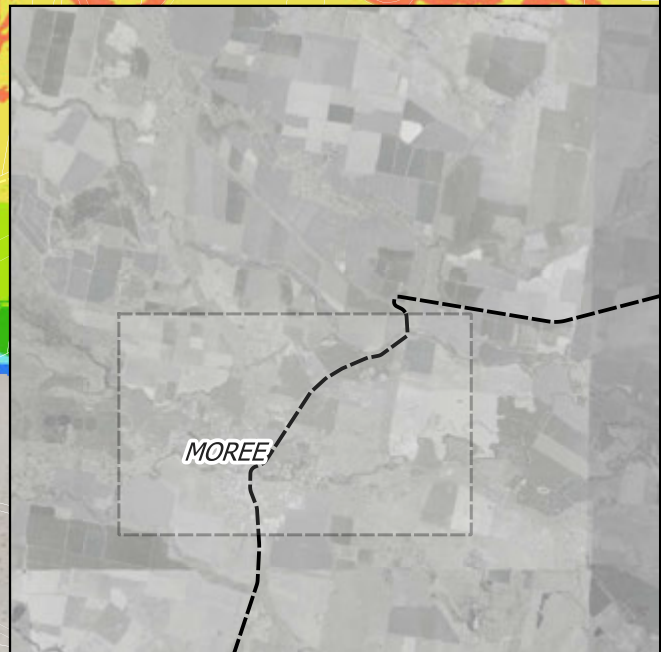



Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

Flood Hazard (ARR 2019):

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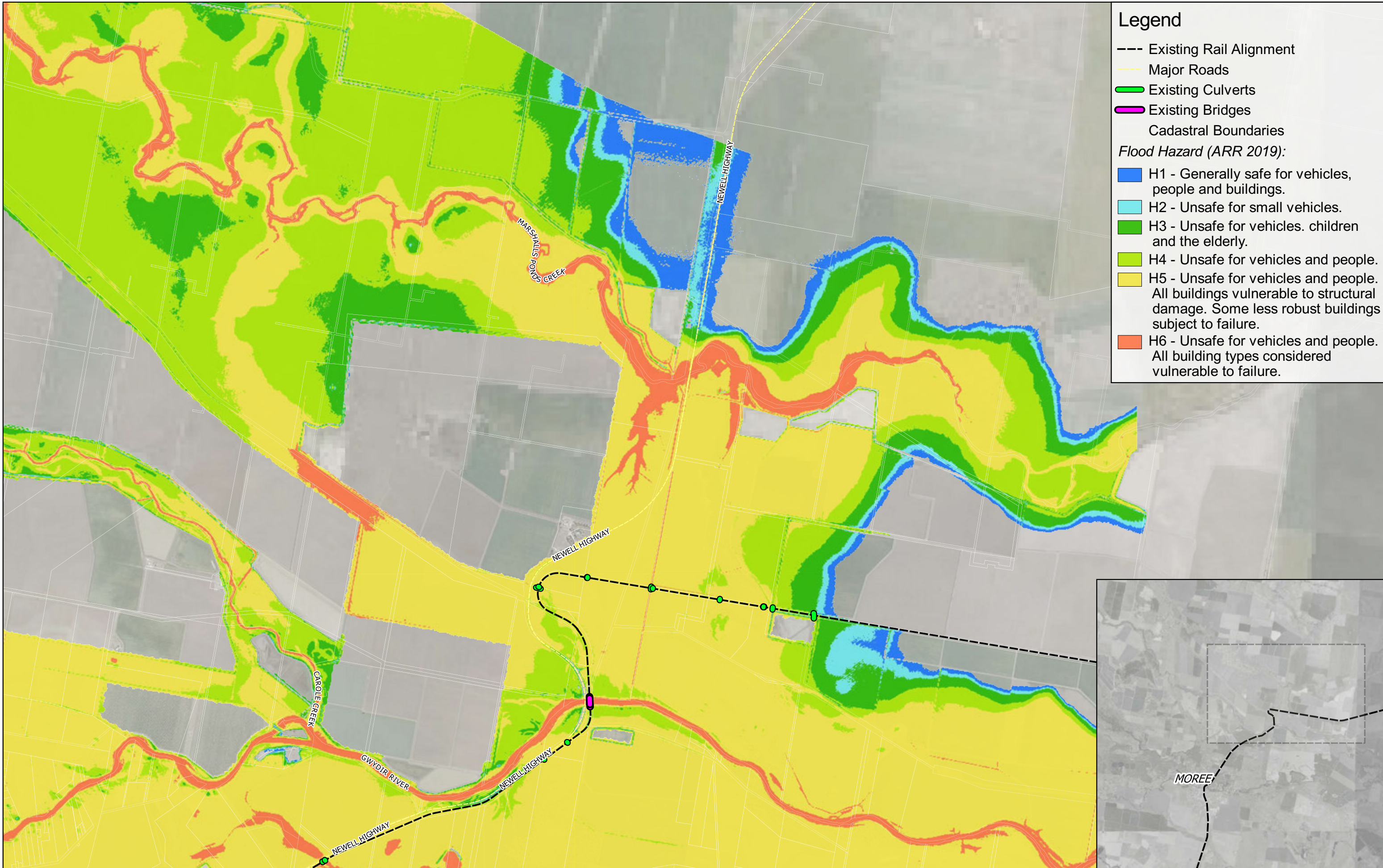

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Stage: EIS
 Version: C
 Author: JS
 Approved by: RL
 Date: 28/03/2022

Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: PMF
 Sheet 2
 Map ID: EX_HAZ_PMF_2

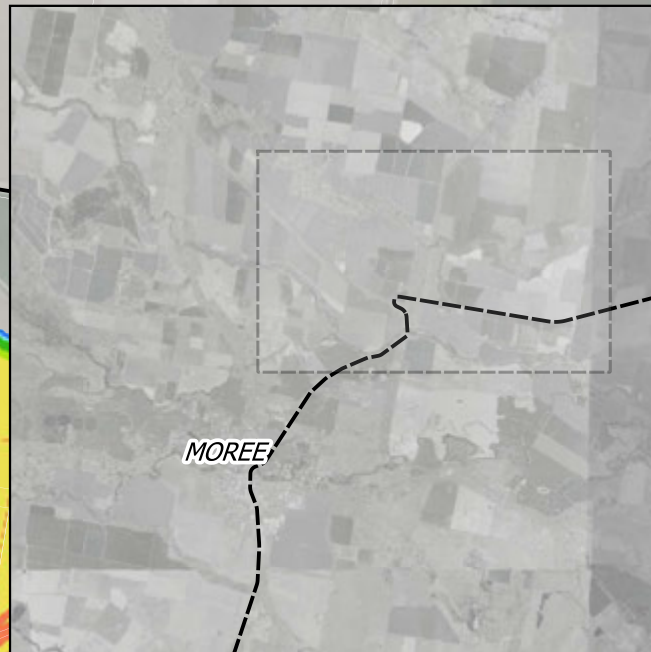


Legend

- Existing Rail Alignment
- Major Roads
- Existing Culverts
- Existing Bridges
- Cadastral Boundaries

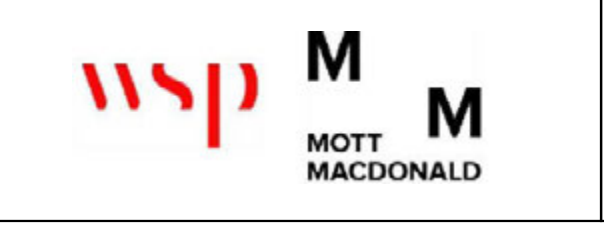
Flood Hazard (ARR 2019):

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Inland Rail - Narrabri to North Star Phase 2
 Peak Flood Hazard (ARR 2019) - Existing Conditions Scenario
 Event: PMF
 Sheet 3
 Map ID: EX_HAZ_PMF_3