

Wellington State Highway Network

Developing a 5-year Stormwater
Monitoring Plan

May 2023



Introduction

- Background to the regional policy setting
- Current state highway network in the Wellington Region
- Consent (what's in the mix!)
- Approach to identifying monitoring sites
- Priorities for monitoring
- Implementation

Background

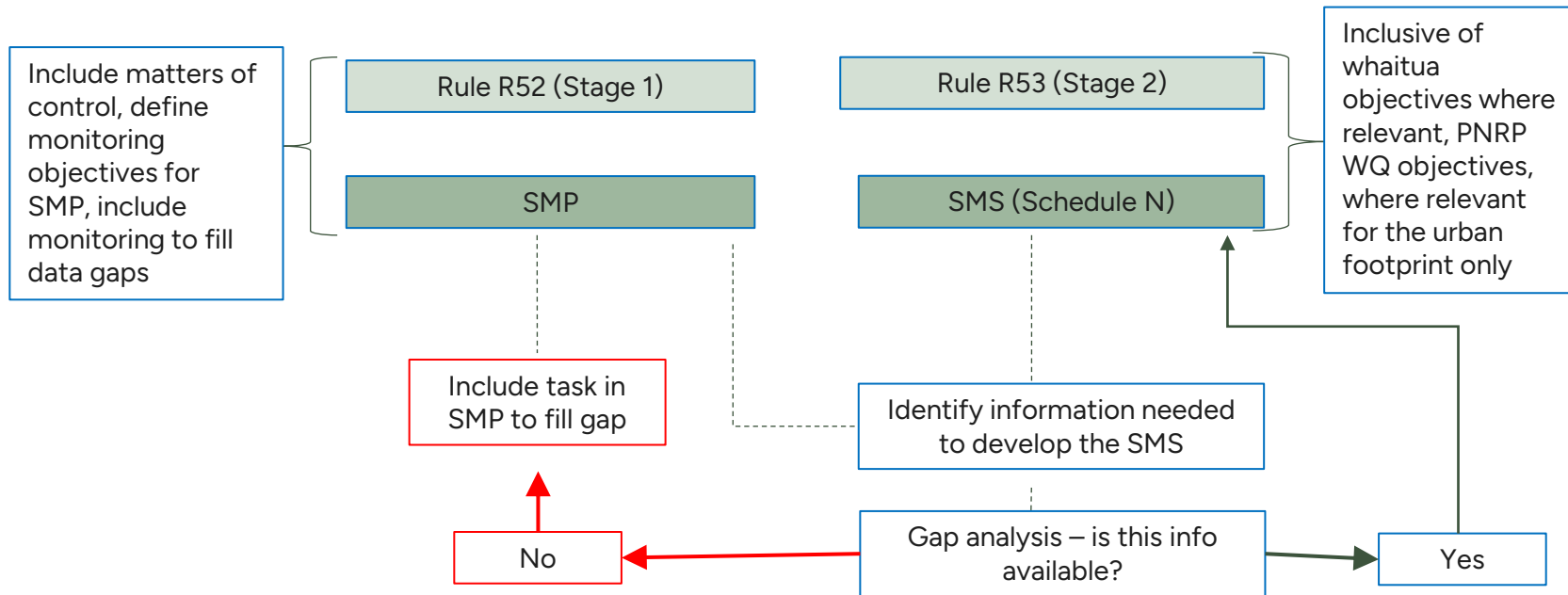
- Regional Policy setting
- Policy – P83 & P84
- Rule – R52
- Since 2018, new generation of global stormwater consents have been implemented under the new policy and rule settings:
 - KCDC GSC (2018)
 - WWL GSC (2019)
 - CentrePort (2018)
 - MDC (2022)
 - CDC (2022)
 - Waka Kotahi (2022)
 - WIAL (2023)



Policy P83: Minimising adverse effects of stormwater discharges

Policy P85: Development of a stormwater management strategy and for first-stage local authority and state highway network consents

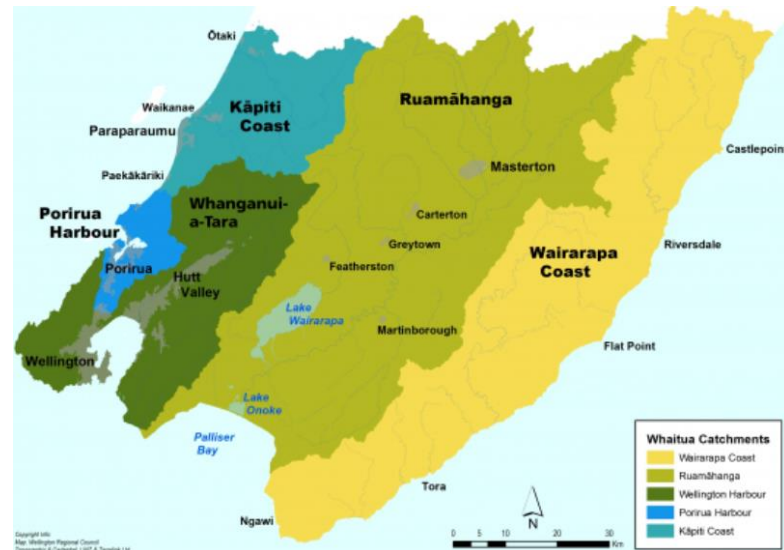
Policy P86: Second-stage local authority and state highway network consents





Consenting process

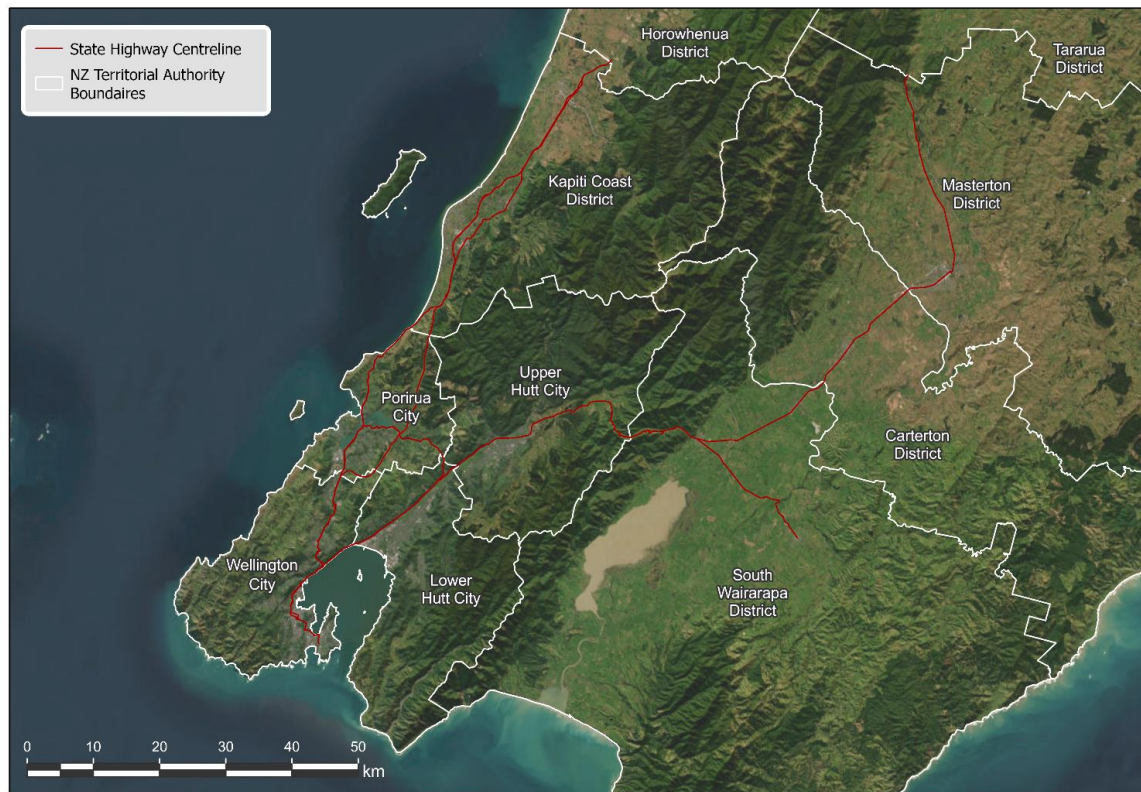
- Two stage consent process
- Stage One - short term (5 years)
 - Information gathering
 - Knowledge Gaps
- Stage Two – long term (25 years)
 - Development of a Stormwater Management Strategy
 - Address specific items listed under Schedule N of the PNRP
 - Integration of freshwater outcomes as set out in the Whaitua Implementation Plan (WIP – GWRC's process for NPSFM implementation, 5 WIPs in the region to cover 8 TLAs)





Wellington State Highway Network

- 880 km highways
- ~350 ha sealed road (0.04% of region)
- SH1 (includes TGM, M2PP, PP2O)
- SH2 (to Masterton north)
- SH58 (Porirua)
- SH59 (Linden to McKays Crossing)
- SH57 (Martinborough)





Existing Environment

- SH crosses 31 sub-catchments across the region
 - Equivalent spatial classification as applied to the existing GSC
 - South Wairarapa townships treated as one due to not having a GSC in place
- SH: 20 interchanges
- SH Catchpits:
 - WCC: 706
 - PCC: 505
 - KCDC: 659
 - HCC: 487
 - UHCC: 266
 - SWDC: 137
 - CDC: 49
 - MDC: 101





Consent requirements

- Consent issued October 2022, 5-year information gathering;
- Scope includes stormwater discharges to freshwater and coastal receiving water and soil sampling ;
- Identification of sites in relation to potential contaminant 'hot-spots'; and
- Implement data gathering, including sites of cultural significance to inform the drafting of the Stormwater Monitoring Strategy (long term)



Monitoring objectives:

- To undertake focused, cost effective, and efficient monitoring of stormwater discharges to
 - build a robust baseline data set;
 - continuously improve knowledge about stormwater data collected across the Wellington SH network; and
 - understand potential effects in sensitive freshwater and coastal receiving environments.
- To identify sub-catchments, contaminant sources, and stormwater discharges of priority concern; and
- To share stormwater discharge monitoring data with other agencies to provide a sound understanding of the impact of the SH network's stormwater discharge on the receiving environment

Approach to identifying sites

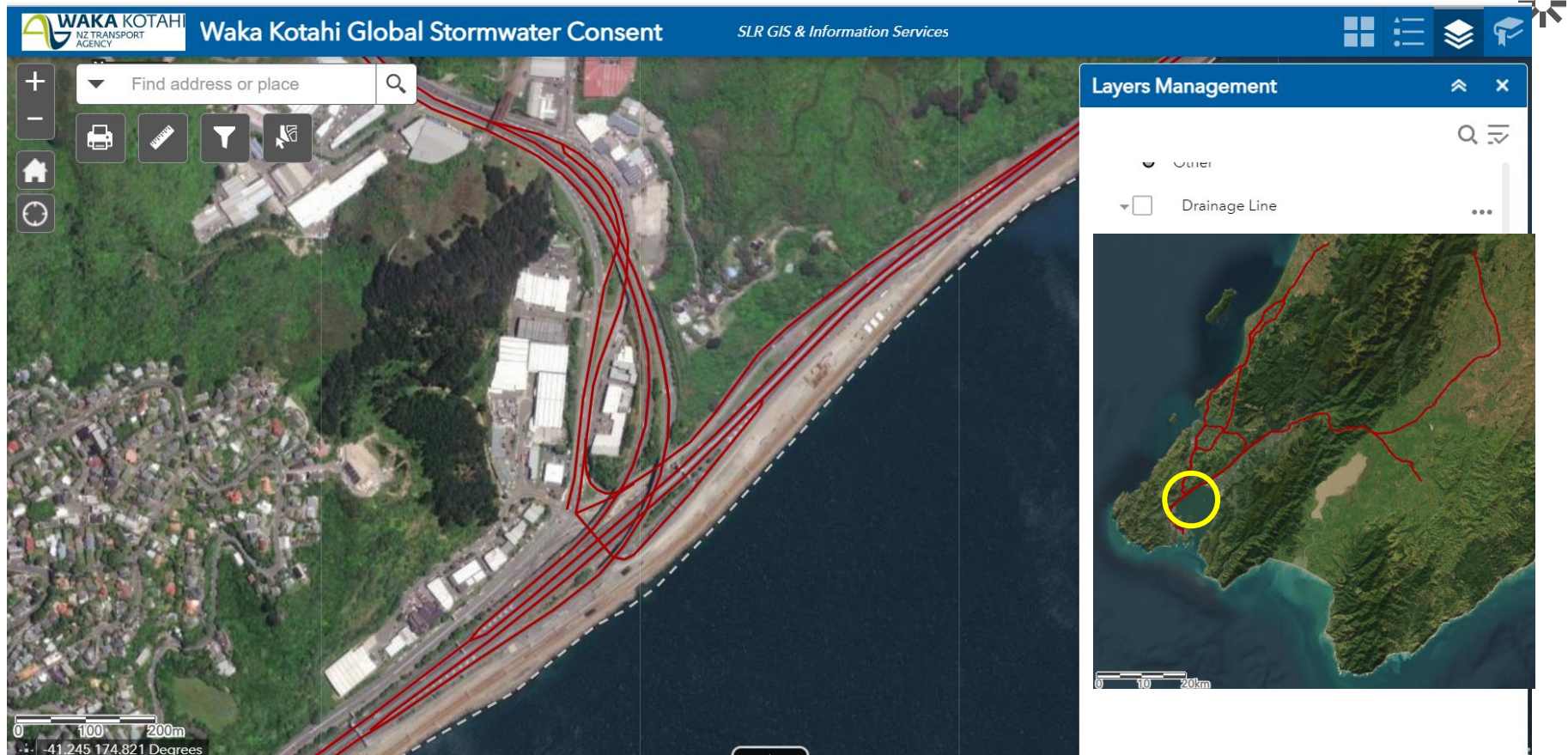
- Webmap construction – information management
- SH stormwater asset data & drainage
- Identification of drainage receiving locations (pipe, land, surface water)
- Contaminant Load Model:
 - Simplistic, unattenuated loads
 - Identification of potential 'hot-spots' per sub-catchment & road segment
 - Tool to assist in prioritization
- Overlaps with Scheduled sites / sensitive receiving environments (from NRP)



Discharge to land, pipe or surface water

1. Identification of key surface water locations likely to receive the bulk of the discharge from the SH
2. Categorise the SH in terms of where the stormwater discharges to
3. Identification of whether these are likely 'hot-spots'





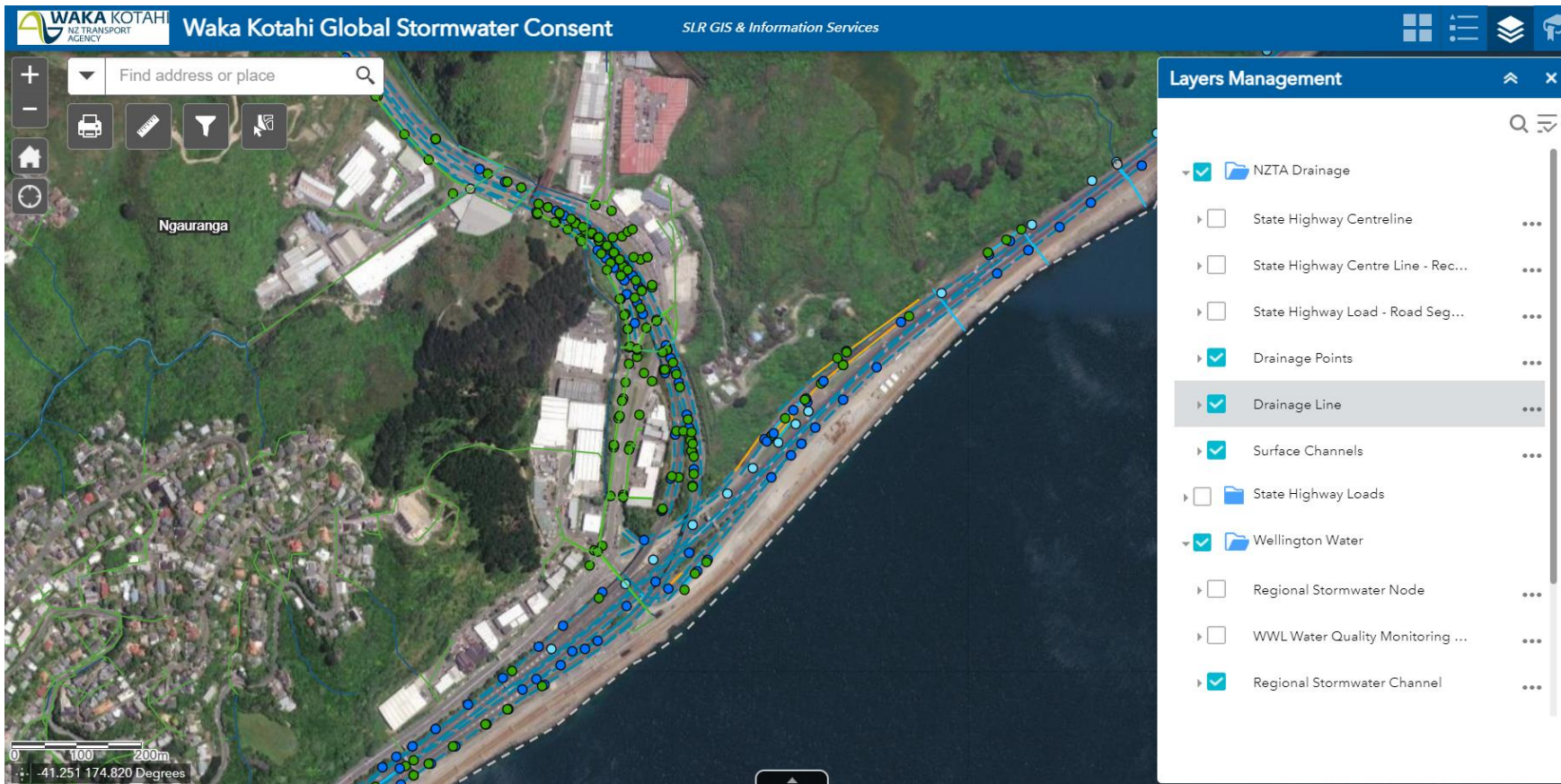
Example: Ngauranga Interchange (Wellington): SH Centrelines



Layers Management

- ☒ NZTA Drainage
 - ☐ State Highway Centreline ...
 - ☐ State Highway Centre Line - Rec... ...
 - ☐ State Highway Load - Road Seg... ...
 - ☒ Drainage Points ...
 - ☒ Catchpit
 - ☒ Manhole
 - ☒ Soak Pit
 - ☒ Sump
 - ☒ Other
 - ☒ Drainage Line ...
 - ☒ Stormwater Pipe

Example: Ngauranga Interchange (Wellington): Stormwater asset features



Example: Ngauranga Interchange (Wellington): Stormwater asset features



Layers Management

- ☒ NZTA Drainage
 - ☐ State Highway Centreline ...
 - ☒ State Highway Centre Line - Rec... ...
- ☐ Pipe
- ☐ Land
- ☐ Water
- ☐ State Highway Load - Road Seg... ...
- ☐ Drainage Points ...
- ☒ Catchpit
- ☒ Manhole
- ☒ Soak Pit
- ☒ Sump

Categorised the SH centreline as discharge to pipe, land, or surface water



Contaminant Load Model as a prioritisation tool

- CLM (AC, v2.0)
- Applied the across the SH network (impervious sealed area only)
- Applied export coefficients for TSS, TCu, TZn, TPH
- Used vehicle count data (AADT) where available
 - Insufficient time for TGM & PP2O – to be updated as it becomes available
- Unattenuated raw loads
- Assigned as discharge to land, pipe, surface water
- Expressed as relative proportions for purpose of prioritisation



CLM cont.



Categorised the SH centreline as proportional contaminant load percentiles (20% bands)



CLM cont.

- Hot-spots:
 - CLM aggregated across sub-catchments
 - CLM output per road segment (as per RAMM data)
 - Expressed as discharge to land, pipe, surface water
- Initial priorities identified for the higher proportions discharging to surface water.



CLM output across the region

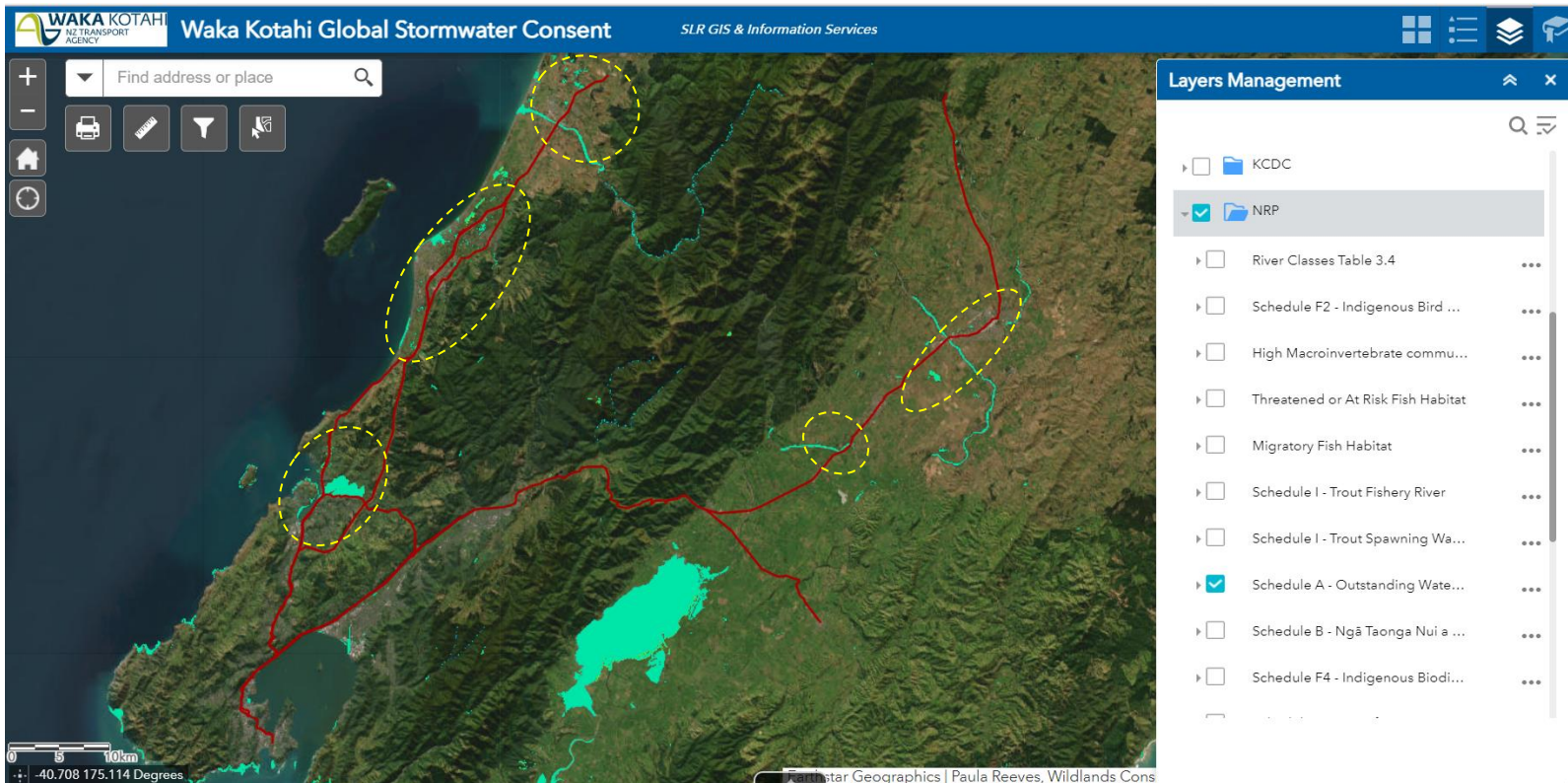


Approach to identifying monitoring sites (methods)

- Webmap construction to manage information requirements
- Identification of drainage receiving locations (pipe, land, surface water)
- Proportion of discharge contributing to different receiving environment types
- Contaminant Load Model:
 - Simplistic, unattenuated loads
 - Identification of potential 'hot-spots' per sub-catchment & road segment
 - Tool to assist in prioritisation
- Overlaps with Scheduled sites / sensitive receiving environments (from NRP)



Approach to identifying monitoring sites



NRP Category A and Schedule A water bodies considered priorities

Priorities for monitoring

- Principles of Adaptive Management extended to Adaptive Monitoring
- Overlaps with Scheduled sites / sensitive receiving environments (from NRP)
- Staggered design



Monitoring Plan – Year 1

- Focus on key sites across Wairarapa, UHCC, HCC, WCC
- Make sure we have the right collection methods
- Avoid sites needing TMP, but can use certified TI
- Discharge from end of pipe
 - Grab samples
 - For surface water – upstream/downstream, end of pipe
 - Trial Nalgene samplers for wet weather deployment
 - Confirm sites for sediment sampling (catchpits) & depositional zones



Example: Ngauranga interchange

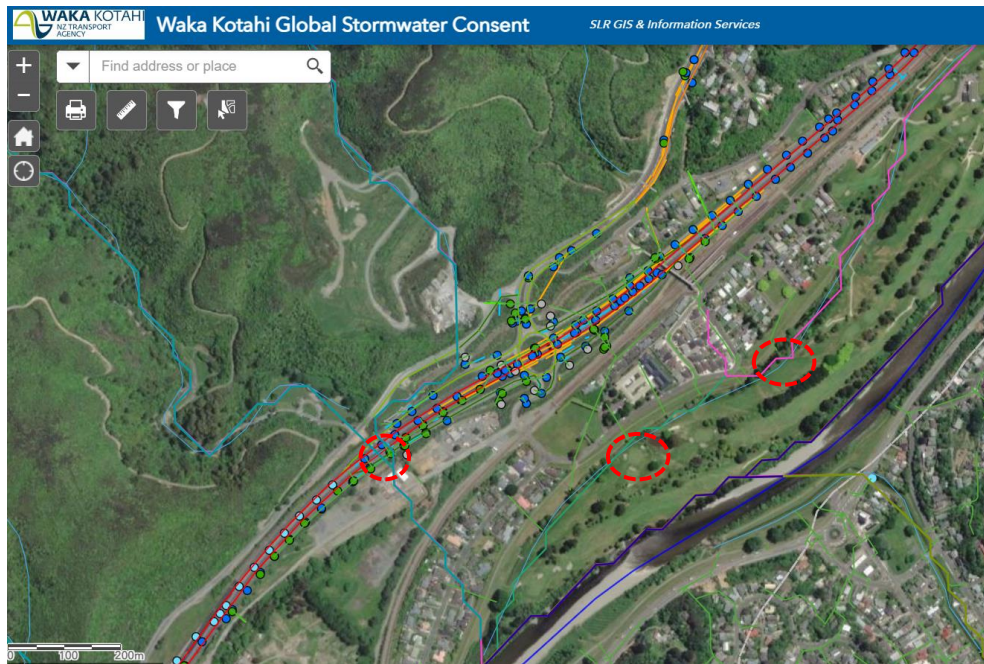
- Existing monitoring under the WWL GSC (2 sites)
- High contaminant load
- Drains to Class 2 stream & to Wellington Harbour
- Wellington Harbour:
 - Schedule B - Ngā Taonga Nui a Kiwa: Te Whanganui-ā-Tara (Wellington Harbour)





Example: Haywards Hill (SH2-58 interchange)

- Proximate WWL GSC (1 sites but on opposite bank)
- High contaminant load
- Drains to Class 6 stream & to Hutt River
- Hutt River:
 - Schedule F1: Rivers and lakes with significant indigenous ecosystems
 - Habitat for 6 or more migratory indigenous fish species



End of pipe discharge
Catchpit samples (blue) / transect of stream sediments



Monitoring Plan – Year 2-4

- Sediment sampling roll out
 - Catchpit schedule (coordinate with night time contractors)
 - Align with receiving environment sampling locations
- **Year 2: Kāpiti area**
 - PP2O treatment device (e.g. treatment wetlands / pond) sampling using Autosamplers and paired with grab / Nalgene samplers across other sites
- Sites of cultural significance for iwi



Monitoring Plan – Year 2-4

- Kapiti Area
- Multiple sensitive sites
- Establish 2 sites for autosamplers
 - Treatment wetlands /ponds that function as stormwater treatment (as opposed to providing ecological or flood attenuation/offset storage)
- Targeted grab/Nalgene at 'end of pipe'
- Cultural monitoring

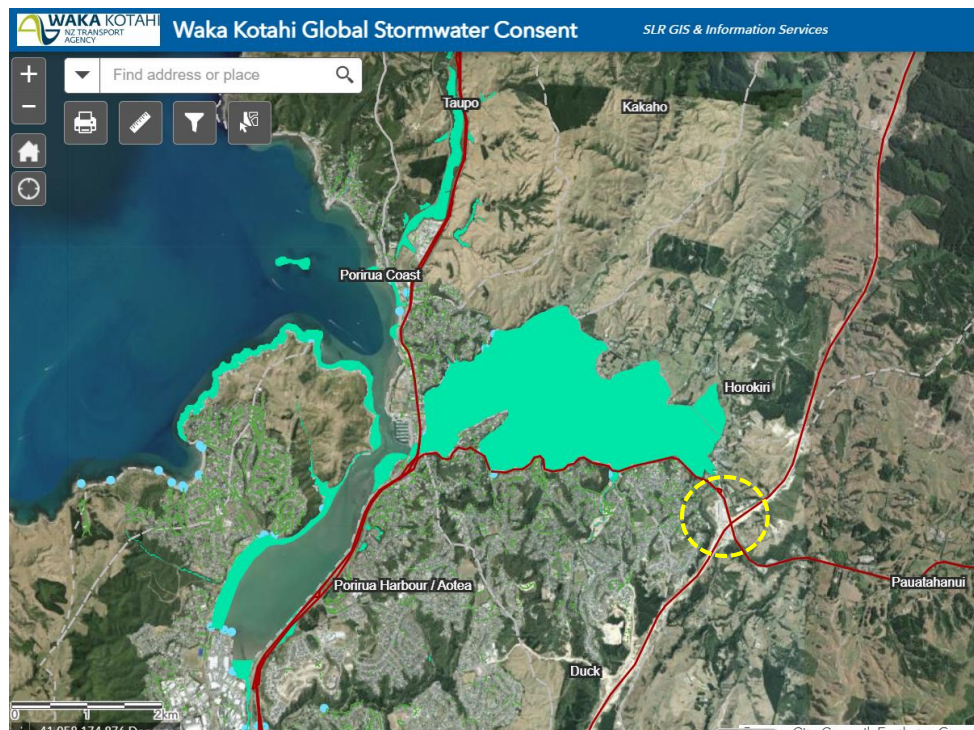




Monitoring Plan – Year 2-4

■ Year 3: Porirua area

- TGM treatment device (e.g. treatment wetlands / pond) sampling using Autosamplers and paired with grab / Nalgene samplers
- Sites of cultural significance for iwi
- Information about treatment wetlands to being compiled as part of the TGM consent process (final design drawings)
- Year 4 & 5: gap filling & follow ups



Hot spots at interchange to SH58

Te Awarura o Porirua Harbour – sensitive environment



Questions?



Making
Sustainability
Happen

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