

Better data, better decisions

Reforming closed landfill monitoring

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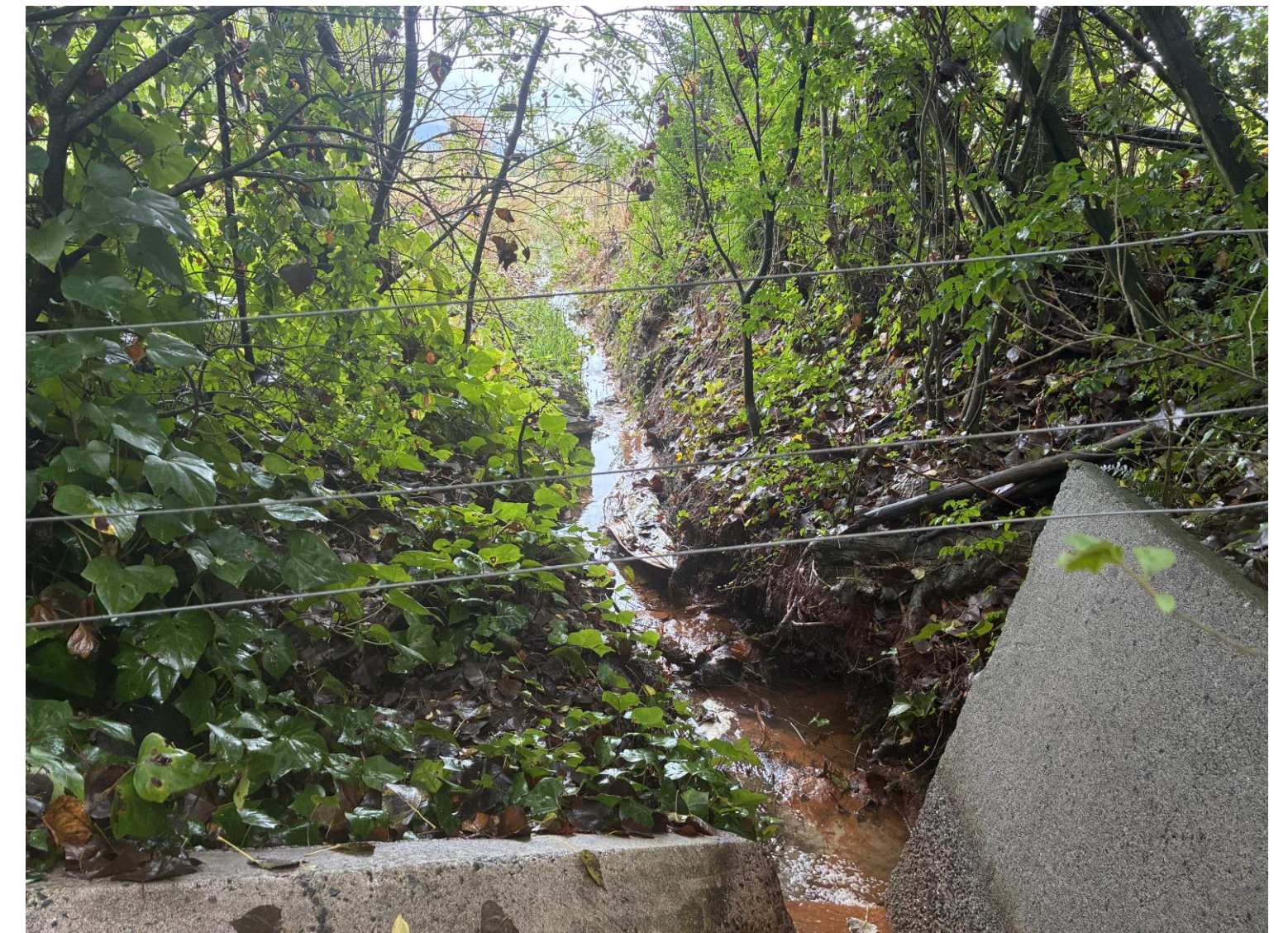
Closed landfills in New Zealand

- Over 3000 landfills
- Usually owned/managed by local authorities
- Discharges to air, land and water consented by regional councils



Discharge consents

- Outline the monitoring requirements of closed landfills:
 - Surface water
 - Groundwater
 - Leachate
 - Landfill gas
 - Site inspections
- Legacy consents often outdated
- Poor monitoring requirements = poor monitoring data
- Poor data = difficulty assessing environmental risk
- Can lead to non-compliance



Improving the monitoring data

- Fit-for-purpose monitoring needed to provide quality data
- Quality data = better assessment of environmental risk
- Consent review of monitoring requirements

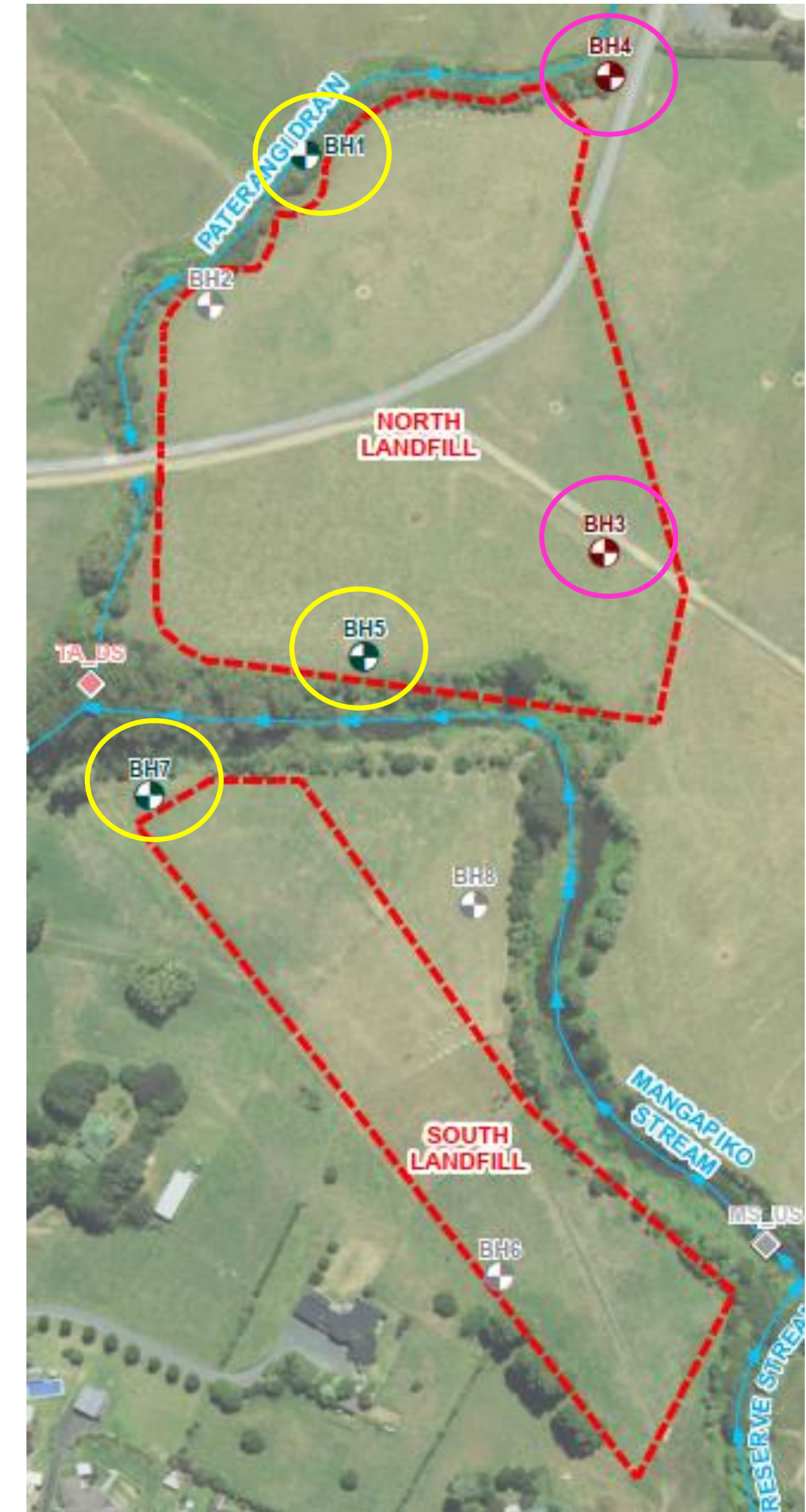


Consent review

- Summarise current requirements
- Review all monitoring data to date
- Amend the monitoring requirements:
 - Sampling locations
 - Analysis suites
 - Monitoring frequency & timing
 - Compliance limits
 - Contingency measures
- Balance quality monitoring with pragmatism & cost



Sampling locations



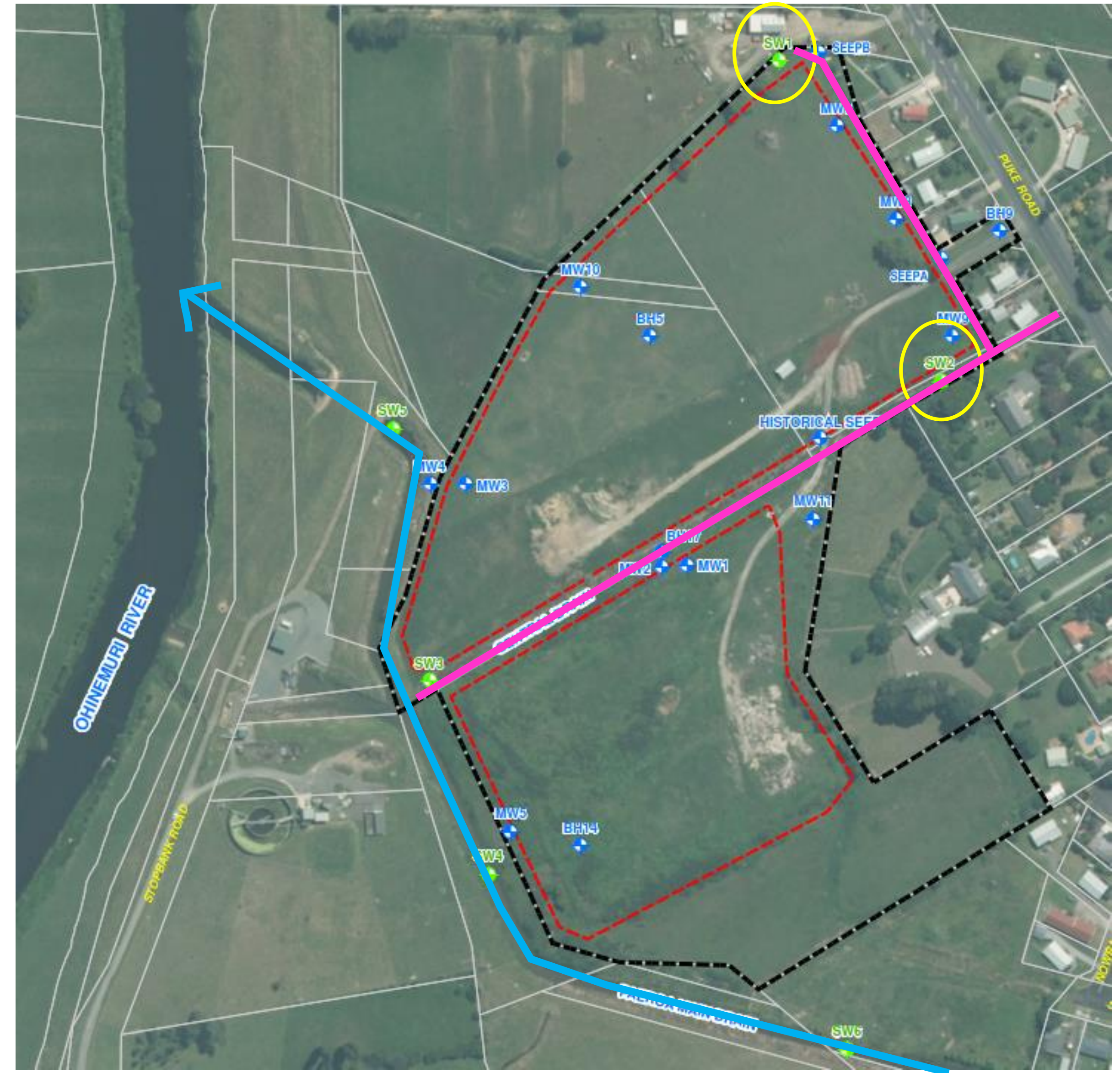
Analysis suites

Original surface water suite	Original groundwater suite	Proposed SW & GW suite
<p>pH Chloride Ammoniacal nitrogen</p>	<p>pH Conductivity Chloride Ammoniacal nitrogen Nitrate nitrogen Total organic carbon Total potassium Dissolved zinc Dissolved boron</p>	<p>pH Conductivity Chloride Ammoniacal nitrogen Nitrate nitrogen Dissolved arsenic Dissolved boron Dissolved cadmium Dissolved chromium Dissolved copper Dissolved iron Dissolved lead Dissolved manganese Dissolved nickel Dissolved zinc</p>



Monitoring frequency & timing

- Groundwater minimum (summer) vs maximum (winter)
- Quarterly, 6-monthly, annually?



Compliance limits

WasteMINZ Guidelines say compliance limits can be set in two ways:

1. Typical concentrations

2. Concentrations above which adverse environmental effects may occur (risk based):

- ANZG
- CCME
- Regional Plan

Can also compare to control sites.

Parameter / analyte	Proposed compliance limit (g/m ³)	Source of compliance limit
pH	-	-
Conductivity	-	-
Chloride	120	CCME (long-term exposure value)
Ammoniacal nitrogen	1.2	ANZG
Nitrate nitrogen	1.5	ANZG (value used for soft water)
Dissolved arsenic	0.042	ANZG (value used for arsenic V)
Dissolved boron	1.5	ANZG
Dissolved cadmium	0.0004	ANZG
Dissolved chromium	0.006	ANZG (value used for chromium VI)
Dissolved copper	0.0018	ANZG
Dissolved iron	0.43	ANZG
Dissolved lead	0.0056	ANZG
Dissolved manganese	2.5	ANZG
Dissolved nickel	0.013	ANZG
Dissolved zinc	0.015	ANZG



Contingency measures

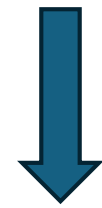
Options include:

- Risk assessment of exceedance
- Remedial measures – require discussion with the regulatory authority

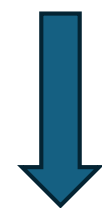


Summary

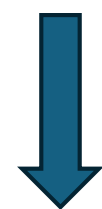
Reviewing consent



Monitoring fit-for-purpose



Better data



Allows a risk assessment of discharges



Better decisions

Less non-compliance

Better environmental outcomes



General findings

- Rural landfills often in sensitive environments
- Small, rural landfills ≠ small problems
- Better engagement from regulatory authority
- Clients are better informed

