

AI for Smarter Environmental Monitoring

Faster Insights, Greater Efficiency



Operation Context

- Tauranga City Council and NZTA Waka Kotahi project
- \$149m construction value
- Transport project on an economically significant roading network
 - Existing infrastructure upgrade, safety improvements, walking and cycling upgrades
 - Earthworks, pavement construction, structures (retaining walls), ecological restoration, drainage and utilities
- IS project v1.2
 - Achieved Commended rating for Design
 - Underway with As-Built rating





Operation Context



Operation Context



- Resource Consent requirements around construction noise and vibration
 - Construction Noise & Vibration Management Plan
 - Site Specific noise & Vibration Plan
 - Consultation and mitigation requirements
- Monitoring to ensure compliance with the requirements
- Stakeholders immediately adjacent to works
 - School
 - Businesses
 - Residential
- Monitoring can be painful, time consuming

Day of week	Time	dB LAeq(15min)	dB LAfmax
Noise Criteria at Residential Neighbours & Noise Sensitive Activities (including Tauriko School)			
Weekdays	0630 – 0730	55	75
	0730 – 1800	70	85
	1800 – 2000	65	80
	2000 – 0630	45	75
Saturdays	0630 – 0730	45	75
	0730 – 1800	70	85
	1800 – 2000	45	75
	2000 – 0630	45	75
Sundays and Public Holidays	0630 – 0730	45	75
	0730 – 1800	55	85
	1800 – 2000	45	75
	2000 – 0630	45	75
Noise Criteria at Commercial/Industrial Neighbours			
All days	0730 - 1800	70	n/a
	1800 - 0730	75	n/a



Real Time, Simplified Monitoring



Real Time, Simplified Monitoring

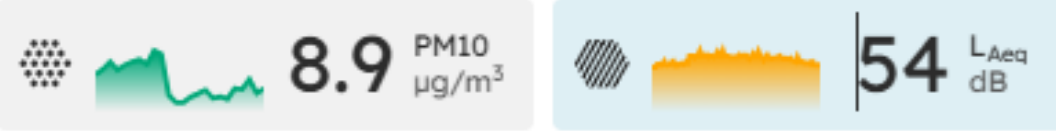
- Resource consent criteria translated into the software
- Ability to input custom 'rules' – equivalent to criteria
- Other features such as weather effected periods, working hours
- Set up everything before monitoring to allow time saving later
 - Avoiding data interpretation
 - Simplified presentation

Noise Rules

Name ^	Parameters	Threshold
Beeper Noise	L _{Aeq}	40
1. Mon-Fri Noise Limit Morning (6:30am-7:30am)	L _{Aeq}	55
2. Mon-Fri Noise Limit Day (7:30am-18:00pm)	L _{Aeq}	70
3. Mon-Fri Noise Limit Evening (18:00pm-20:00pm)	L _{Aeq}	65
4. Mon-Fri Noise Limit Night (20:00pm-6:30am)	L _{Aeq}	45
5. Sat Noise Limit Morning (6:30am-7:30am)	L _{Aeq}	45
6. Sat Noise Limit Day (7:30am-18:00pm)	L _{Aeq}	70
7. Sat Noise Limit Evening (18:00pm-20:00pm)	L _{Aeq}	45
8. Sat Noise Limit Night (20:00pm-6:30am)	L _{Aeq}	45
9. Sun Noise Limit Morning (6:30am-7:30am)	L _{Aeq}	45
10. Sun Noise Limit Day (7:30am-18:00pm)	L _{Aeq}	55
11. Sun Noise Limit Evening (18:00pm-20:00pm)	L _{Aeq}	45
12. Sun Noise Limit Night (20:00pm-6:30am)	L _{Aeq}	45

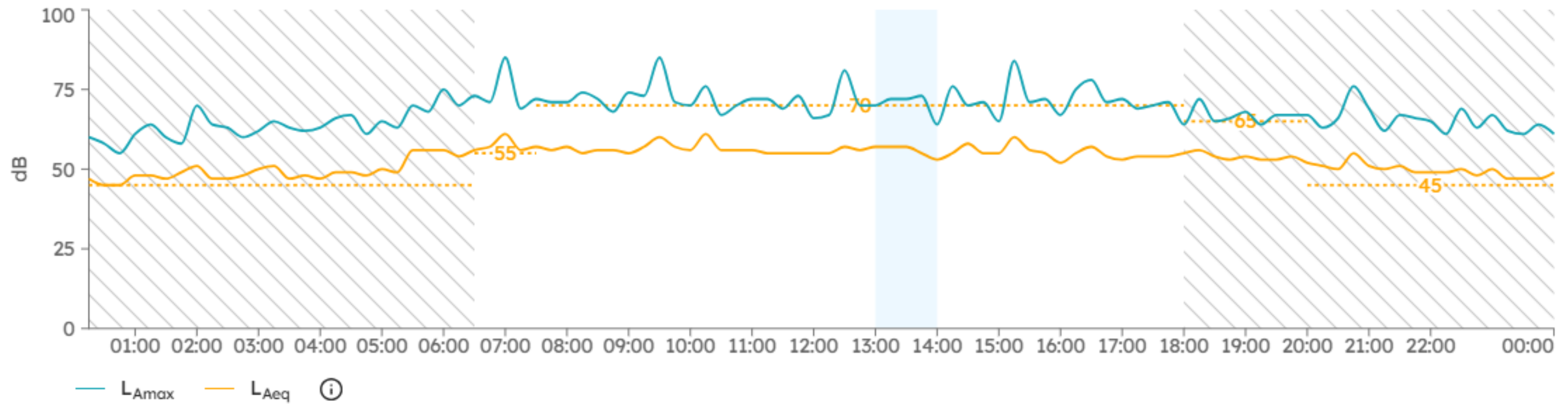
Live Dashboard View

NOI - 587 Cambridge Road
Noise - Average



Sound Levels 15 min periods






17 Dec 2025



Media 81 Direction of Arrival Weather

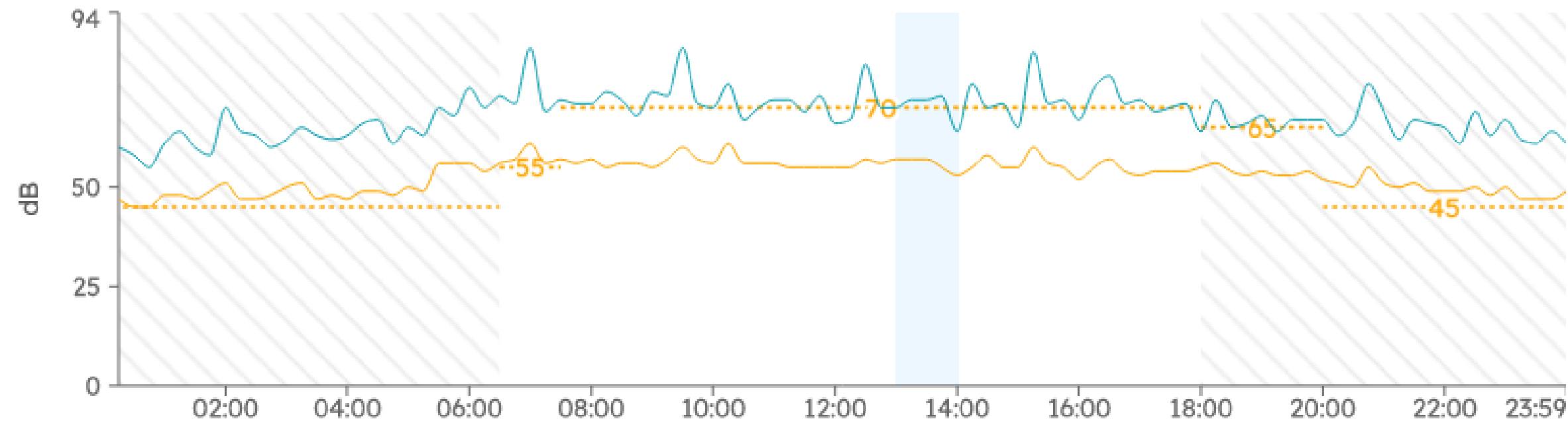
Media - Item 81 of 81

17 Dec 2025

Urban Traffic	Heavy Plant Tracked Moving	Heavy Plant Idling	Heavy Plant Or Vehicle Moving	Urban Background Noise
				
75dB 17:16	75dB 17:32	77dB 17:50	76dB 18:07	78dB 18:22

Reporting

Sound Levels | NOI - 587 Cambridge Road | 15 min periods 17 Dec 2025



Parameters

— LAmax

— LAeq

Thresholds

- | | | | |
|-------------------------------------|---------------------------------------|---------------------------------------|------------------------------------|
| 1. Mon-Fri Noise Limit | 2. Mon-Fri Noise Limit | 3. Mon-Fri Noise Limit | 4. Mon-Fri Noise Limit |
| --- 55 Morning (6:30am-7:30am) 55dB | --- 70 Day (7:30am-18:00pm) 70dB | --- 65 Evening (18:00pm-20:00pm) 65dB | --- 45 Night (20:00pm-6:30am) 45dB |
| 5. Sat Noise Limit | 6. Sat Noise Limit Day | 7. Sat Noise Limit | 8. Sat Noise Limit |
| --- 45 Morning (6:30am-7:30am) 45dB | --- 70 (7:30am-18:00pm) 70dB | --- 45 Evening (18:00pm-20:00pm) 45dB | --- 45 Night (20:00pm-6:30am) 45dB |
| 10. Sun Noise Limit | 11. Sun Noise Limit | 12. Sun Noise Limit | |
| --- 55 Day (7:30am-18:00pm) 55dB | --- 45 Evening (18:00pm-20:00pm) 45dB | --- 45 Night (20:00pm-6:30am) 45dB | |

Other

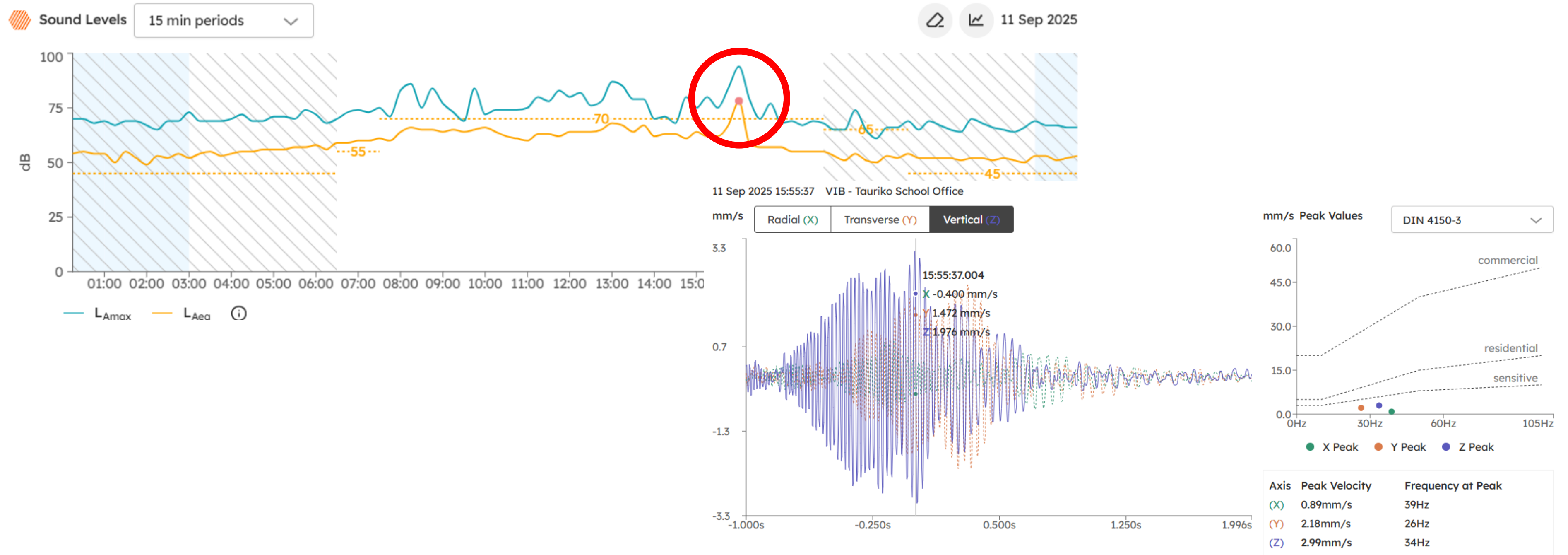
■ Potentially weather affected periods

▨ Out of Hours

dB 15 min periods	NOI - 587 Cambridge Road				
	LAmin	LA90	LAeq	LA10	LAmax
17 Dec 2025 00:15	42	43	47	48	60
17 Dec 2025 00:30	43	44	45	46	58
17 Dec 2025 00:45	42	43	45	46	55
17 Dec 2025 01:00	44	45	48	49	61
17 Dec 2025 01:15	44	45	48	49	64
17 Dec 2025 01:30	44	45	47	48	60
17 Dec 2025 01:45	44	46	49	51	58
17 Dec 2025 02:00	43	45	51	52	70
17 Dec 2025 02:15	41	43	47	49	64
17 Dec 2025 02:30	43	45	47	47	63
17 Dec 2025 02:45	43	45	48	50	60
17 Dec 2025 03:00	45	47	50	52	62
17 Dec 2025 03:15	43	46	51	53	65
17 Dec 2025 03:30	41	42	47	48	63
17 Dec 2025 03:45	41	43	48	49	62
17 Dec 2025 04:00	41	43	47	49	63
17 Dec 2025 04:15	41	43	49	50	66
17 Dec 2025 04:30	41	42	49	52	67
17 Dec 2025 04:45	41	44	48	51	61
17 Dec 2025 05:00	43	45	50	53	65
17 Dec 2025 05:15	43	44	49	52	63
17 Dec 2025 05:30	45	47	56	60	70
17 Dec 2025 05:45	46	49	56	60	68
17 Dec 2025 06:00	46	48	56	58	75

AI Audio Classification

- Noise & vibration exceedances recorded outside school
- No project related works ongoing near school at time/date



AI Audio Classification

- Recording and AI classification tool recorded and classified exceedance
- Upon further investigation...

NOI - Tauriko School Office
All Aspects - Max Values



Item Dropping 75dB 15:31

Hand Tools 88dB 15:46

Human Activity 78dB 16:12

Excavation 76dB 16:36

Wasn't us!

- Not projected related noise generation
- School had independent contractors doing work
- Extremely useful to avoid any non-compliances and keep the record clean



Harnessing AI and Technology

Benefits

- Tailoring monitoring specifically to the project
- Ability to do low maintenance, long term monitoring
- Avoiding manual data collection/interpretation
- Time savings in reporting
- AI classification tools save time and can act as evidence to avoid non-compliances
- Reduces reliance on others – ability to self perform