

Coal Tar in Auckland Roads

RCA Forum November 2015



Coal Tar in Auckland

AC has proposed that, on the basis of the prevalence of coal tar in Christchurch roads and a study in 2009 by NIWA, that it is more likely than not that coal tar also exists in soil under roads in Auckland constructed before 1960 – 1970 (depending on which version/person you ask).

AC has

- not provided any empirical evidence to support this position
- officers are applying the position as if it were fact

This position has huge implications for AT and other network utility operators as well as AC (as one of AT's funders) in terms of time and cost.

There is confusion among consultants and regulatory services as to how to identify coal tar and AT has received a number of false positive test results.

AT Research

To understand whether there is coal tar in Auckland roads:

- AT examined whether PAH sources can be differentiated using a combination of quantitative and qualitative techniques/methods.
- The second part used these assessment methods to examine the prevalence of coal tar-sourced PAHs in Auckland roads.

Step 1: Methods used

To differentiate the PAH sources AT has considered a number of methods:

- Laboratory analysis for PAHs – total concentration
- Presence or absence of phenols (depends on age of sample)
- Gas chromatogram
- A radar plot profile
- Ratios of PAHs used in TP378

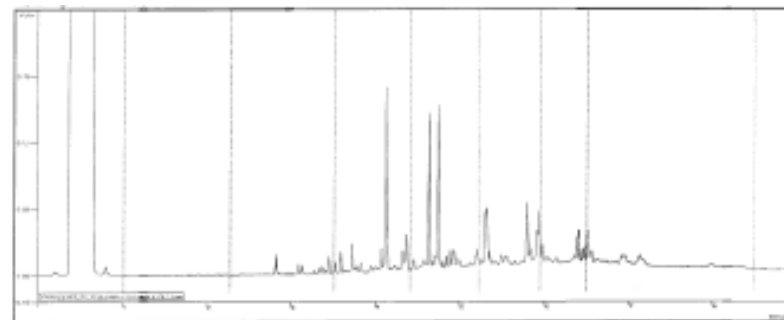
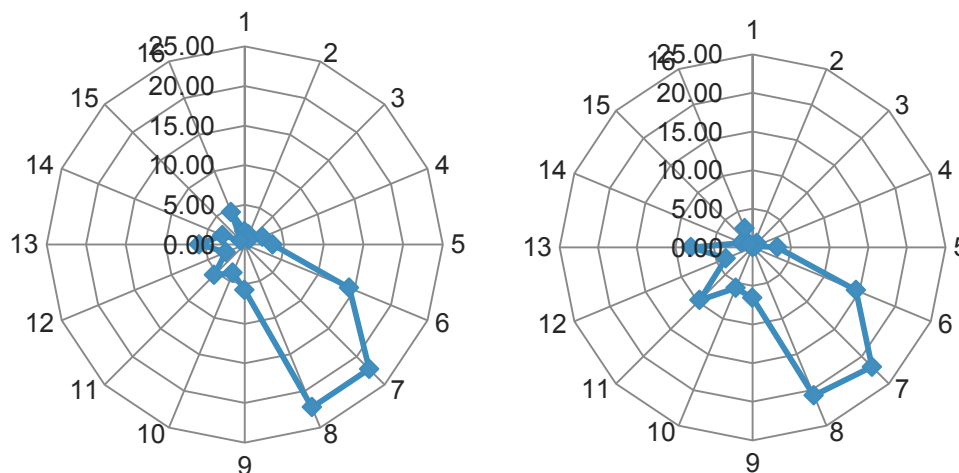
Reference samples of NZ bitumen and coal were analysed by Hill Laboratories for this work.

What have we found?

AT has identified small areas of coal tar in only 11 central city road rehab projects.

Common patterns:

- Elevated PAH concentrations – high 100s or 1000s mg/kg (1888 and 3516mg/kg)
- A GC with peaks similar to the coal tar reference
- Ratios are a bit random – 0.53 and 0.36-0.47
- A radar plot that looks a bit like this.
- Phenols have not been confirmed for historic samples

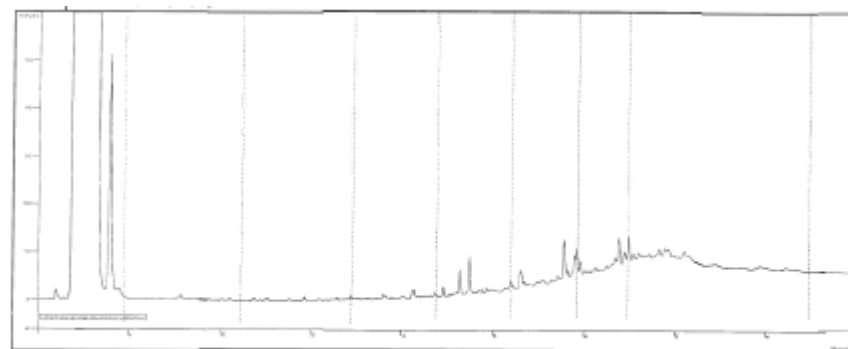
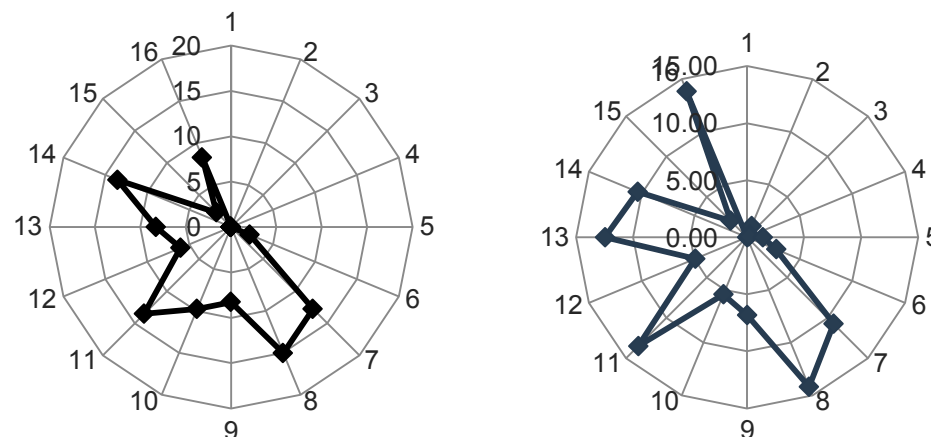


Asphalt samples

AT has tested pavements and soil from roads around the region and often found a profile like bitumen.

Common patterns:

- PAH concentrations typically <100 mg/kg (1.3-29 mg/kg)
- A GC with peaks similar to the bitumen reference or with a heavy oil profile
- Ratios are a bit random – 0.42 and 0.62
- A radar plot like these.
- Absence of phenols can not be confirmed for historic samples.



Step 2: Prevalence in Auckland Roads

Auckland Transport has systematically reviewed the following for laboratory test results and any evidence of coal tar:

- Historic consent applications and AEE documents
- Historic road rehabilitation works
- Recent and current road rehab consent applications
- Works in the road corridor that did not require a consent
- Works from across the whole region.

90%+ of the information utilised is already in the public domain.

Putting it in Context

- Auckland has 7000km of roads
- 1300km of road are in central Auckland and these existed prior to 1970
- Only 11 isolated sites identified as likely to contain coal tar
- These comprise <<5km of road length
- That's <1% of Auckland roads
- Or, being conservative, 5km/28km central roads rehab'd in past 5 years = 17% (ignoring all reconstruction and rehab works before 2010)
- Less than the 50% burden of proof required


Research has identified no empirical evidence to support the assumed position that it is more likely than not that there is coal tar in pre-1960 (or 1970) soil in roads.

What does this mean for Auckland?

- Identification of the PAH source requires many threads of evidence – one test in isolation is NOT enough and AT proposes a combination of quantitative and qualitative measures are used.
- The source of elevated PAHs is really irrelevant – the total PAH concentration and taking appropriate health and safety and disposal measures is far more important.
- AT will continue to undertake test pit sampling for road rehab works to ensure appropriate disposal and safety measures are used.
- AT is seeking a revised position from AC on this issue. AC has accepted ATs conclusions and will revise their position after AT has provided a sampling protocol for testing in the road.

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with



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