# Edithvale and Bonbeach
# Level Crossing removal project

# Report of BARRY JOHN Cook

## 1 Introduction

The AECOM-GHD Joint Venture prepared the technical report titled Air Quality Impact Assessment (Technical Report) which is included as Technical Report I to the Environment Effects Statement (EES) for the Edithvale and Bonbeach Level Crossing Removal Project (Project).

The role that I had in preparing the Technical Report was Air Quality Technical Lead. Other significant contributors to the Technical Report and their expertise is set out as follows:

- Michael Asimakis, GHD, Team Leader – Air, Noise and Meteorology, Victoria

I adopt the Technical Report, in combination with this document, as my written expert evidence for the purposes of the Edithvale and Bonbeach Level Crossing removal project Inquiry and Advisory Committee's review of the EES and draft planning scheme amendment.

## 2 Qualifications and experience

Appendix A contains a statement setting out my qualifications and experience, and the other matters raised by Planning Panels Victoria 'Guide to Expert Evidence'.

A copy of my curriculum vitae (CV) is provided in Appendix B.

## 3 Further work since preparation of the Technical Report

Since the Technical Report was finalised, I have not undertaken any further work in relation to the matters addressed in the Technical Report relevant to the Project.

## 4 Written Submissions

### 4.1 Submissions Received

I have read the public submissions to the EES and draft planning scheme amendment and identified those that are relevant to the Technical Report and my area of expertise. These include the following submissions:

44, 127, 177, 187, 200, 207.

### 4.2 Summary of Issues Raised

The submissions have raised the following issues relevant to my area of expertise.

### 4.2.1 Submission #44

Submitter #44 supports the 'trench option' due to reducing "noise and deisal (sic) pollution from trains".

### 4.2.2 Submission #127

**Submitter #127** has experience in road transport corridor air quality impact assessments and concludes "absolutely no reason for the rail-over-road option to be taken".

### 4.2.3 Submission #177

Submitter #177 is concerned about a 'Skyrail solution' such as used on the Caulfield-Dandenong (CD9) project: "strenuously ask(s) that the effects on residents' amenity from any alternative design option, particularly Skyrail, be considered". In particular "I understand that diesel emissions will also travel further from such an elevated structure."

### 4.2.4. Submission #187

Submitters #187 are long term residents of the area and submit that "no valid reason for not removing these level crossings by way of trench constructions." They were relieved that a trench solution avoids "carcinogenic emissions from overhead trains".

### 4.2.5 Submission #200

Submitter #200 agrees with the 'trench solutions' as it avoids negative effects from a 'Sky Rail". In particular, "Elevated rail carrying diesel trains is likely to increase the amount and distance travelled of airborne pollution because height facilitates greater drift."

### 4.2.6 Submission #207

Submission #207 is from EPA Victoria. In assessing the operational impacts, they conclude (emphasis added) "A change in air emissions associated with the routine operation of the projects will be **insignificant**, due to the ongoing use of electric trains and similar frequency of diesel trains, which are currently in operation on the rail corridor." However, they did identify that air quality risks are associated with "dust generation during construction". They expressed satisfaction that "The EES has identified key project risks and has established appropriate EPRs to manage and mitigate those risks." In continuing with their environment regulatory role:

- "The EPA would welcome the opportunity to review any management plans for the Projects."

## 4.3 Response to Issues Raised

Set out below are my comments and response to the issues raised by the written submissions relevant to the area of my expertise.

The issues raised fall into two categories relating to:

1. Diesel/carcinogenic pollutants during operation; and
2. Construction dust management.

### 4.3.1 Pollutants during Operation

As pointed out in the Technical report (Executive Summary):

- "Operational emissions are already present with the existing operation of the rail corridor which are mixed with ambient concentrations of air pollutants from local traffic and regional sources.

- The rail corridor contributes emissions of diesel engine trains on the Frankston line in the vicinity of the Edithvale and Bonbeach level crossing removal projects."

As summarised by EPA Victoria, the change to air quality impact due to the same number of diesel trains using the corridor is insignificant. The change of rail height (from at-grade to within a rail trench) does indeed slightly alter the dispersion pattern of the diesel engine emitted pollutants.

At the nearest sensitive receptor locations along Nepean Highway and Station Street, the differences are minimal. The level crossing removal would result in very similar concentrations of all pollutants at the nearest sensitive receptors compared to the existing infrastructure. Figures 9 and 10 of Technical Report I for Edithvale and Figures 13 to 16 of Technical Report I for Bonbeach indicate that the change is very small compared to both the assessment level and the background concentrations. It is my opinion that it would be difficult to even find a field instrument able to detect the difference.

At distance (what is known as the far field), there are no differences between at-grade and 'trenched' due to the mixing of the vertical and horizontal profile of pollutants. Immediately next to the trench (known as the near field) pollutants are concentrated before being 'flushed' from the depressed 'line source'. However, within a few tens of metres for the Project circumstances, the differences are sufficiently mixed to produce the insignificant change as noted by EPA Victoria.

### 4.3.2 Pollutants during construction

The issues related to construction dust (or indeed other pollutants, including odour) resulted in a number of Environmental Performance Requirements (EPR's) being formulated. As pointed out in EPA Publication 480, Environmental Guidelines for Major Construction Sites (EPA 1996, p.1):

- "Many of the measures proposed in the Guidelines are also applicable to smaller construction sites (less than five hectares) and should be used where appropriate to avoid and minimise impact from such activities."

While a linear construction corridor may elongate the five hectare area to minimise the intensity of construction emissions, this project area is sufficiently large to result in the recommendation that the Guidelines are followed. Indeed, this is common practice for any contractor likely to be engaged for the Project. It is then entirely appropriate that both the LXRA and EPA Victoria have review and management roles in supervising the construction management plans and framework.

The risk assessment for air quality (see section 6 of Technical Report I) identifies the risk pathways relating to construction. Construction dusts can result in a perceived loss of amenity (dust fallout) and potentially dust levels above limits causing health impacts. Lower rated, albeit not negligible, risk pathways associated with construction relate to construction plant emission of pollutant gases (diesel engines) and odour (acid sulfate soils). Construction dust can be caused by civil works such as earthworks (including material transfer), site clearance and establishment, and vehicle movements. Wind-blown dust due to erosion from exposed surfaces and stockpiles and vehicle movement on unconsolidated surfaces are key areas of concern to be managed by dust management measures (see EPRs AQ1 and AQ2).

It is my opinion that the AQ1 and AQ2 EPR's sufficiently address risk pathways associated with construction smoke, dust, fumes and other pollution into the atmosphere. Similarly, EPR CL2 addresses the odour risks associated with Acid Sulfate Soils management and EPR's CL3 and CL4 deal with potential odour sources if contaminated soils or groundwater are encountered.

Real-time and audit monitoring of construction dust is typical for large construction sites. Real-time monitoring is especially useful for identifying additional, pro-active mitigation measures required to protect off-site sensitive receptor locations from airborne particulate matter causing potential for health impacts. Portable monitoring equipment is located between construction activity and downwind sensitive places – both locations are not fixed for a linear construction project and also change with prevailing winds. As an example, for the Sugarloaf Pipeline project the real-time dust monitors where deployed at the start of each working shift according to the work area and regard to the nearest sensitive place to be protected. Alarm levels were identified in consultation with EPA Victoria at 100 $\mu g/m^3$ over a 15-minute average. Audit monitoring is used to manage the amenity impacts associated with dust fallout. A compliance level is not available in the air quality policies but is defined in the Protocol for Environmental Management: Mining and Extractive Industries (EPA Victoria publication 1191, 2007) and used as a surrogate for large construction sites. Since the compliance level is the excess above background measured over a one month period (2 grams per square metre per 30 ± 2 days), faster reacting measures are also required. This is less quantitative as it relies on visual monitoring by site supervision and quickly responding to stakeholder feedback (viz. a complaints hot-line).

It is my opinion that baseline monitoring is not required for air quality. Conservative assumptions has been made with respect to ambient air pollutant levels that are used to compare operational impacts. The operational impacts are well below the variability in background levels and therefore are a second order effect in assessing impact. For the construction phase, it is the quantum of impact inclusive of background. This is assessed by monitoring at the time of the constructive activity; thereby the baseline (pre-construction) pollution levels are irrelevant.

## Declaration

I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance which I regard as relevant have to my knowledge been withheld from the Inquiry and Advisory Committee.

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**Signed**

**Date: 21 May 2018**

# Appendix A Matters Raised by PPV Guide to Expert Evidence

(a) the name and address of the expert;

Mr Barry John Cook

c/ - GHD 180 Lonsdale St Melbourne

(b) the expert's qualifications and experience;

- 2007 - current Technical Director - Air Quality and Meteorology, GHD
- 2004 – 2007 Principal Meteorologist, Synergetics Environmental Engineering
- 1996 – 2004 Air Quality Control Meteorologist, Mount Isa Mines, Queensland
- 1987 – 1996 VPS Meteorologist, Environment Protection Authority
- 1985 – 1987 Network Meteorologist, Radio Station 3MP
- 1983 – 1985 Technical Assistant, Glaciology Section, University of Melbourne

A CV is attached as Appendix B.

(c) a statement identifying the expert's area of expertise to make the report;

I have been a meteorologist practicing in applied meteorology, including assessing the air quality impacts of projects and forecasting, since my graduation from the Meteorology Department at the University of Melbourne in 1983. This has included many linear transport projects involving the assessment of emissions into the air environment from road and rail vehicles.

Further details are briefly summarised in the CV of Appendix B.

(d) a statement identifying all other significant contributors to the report and where necessary outlining their expertise;

My Technical Report was internally reviewed by Mr Michael Asimakis from within the same Air, Noise and Meteorology assessment team as me. Michael has been employed with GHD for 9 years and undertakes management of major projects across Australia involving the assessment of impact of emissions to air and the environment. Michael has a Bachelor of Science (Applied Mathematics/ Meteorology) from the University of Melbourne.

All GHD Technical Reports are verified (approved for issue). This task was performed for this Technical Report by Mr Stanley Gunawan. Stanley is a Mechanical/Environmental Engineer with more than 8 years of experience. He has specialist skills in acoustic and air quality engineering assessment. Stanley's air quality engineering expertise includes atmospheric dispersion modelling, emissions inventories, emissions reduction, meteorological data analysis and odour buffer (default and directional) assessment. Stanley is experience in air quality dispersion assessment, including dust, odour, and any many other pollutants. Academic qualifications for Stanley are: Bachelor of

Engineering (Mechanical and Manufacturing) (hons), Melbourne University, 2006; Master of Engineering (Project Management), Melbourne University, 2011.

(e) all instructions that define the scope of the report (original and supplementary and whether in writing or oral);

I was supplied with written Scoping Requirements (issued September 2017; Section 3.5). These state "Environmental Performance Requirements (EPRs) should be clearly described in the EMF". The proposed objectives, indicators and monitoring requirements' to be described that are relevant to this study are:

– emissions to air - particularly with respect to managing impacts on amenity both during construction and operation.

The purpose of the Technical Report is to assess and address the air quality impacts resulting from construction (dust and vehicle emissions) and operation (combustion emissions from diesel freight trains) as a result of removing the level crossings.

Clayton Utz provided a letter of instructions to me for 'Engagement of Expert Witness - Air Quality' dated 29 March 2018.

(f) the identity of the person who carried out any tests or experiments upon which the expert relied in making this report and the qualifications of that person;

I did all of the modelling runs for the report. These were technically reviewed by Mr Asimakis.

(g) a statement setting out the key assumptions made in preparing the report;

It is assumed that the train corridor can be assessed in the same manner as a road transport corridor. EPA Victoria are yet to codify the requirement of Clause 40 (4) of the State environment protection policy (Air Quality Management) to 'develop techniques for improved assessment of the environmental impacts of road proposal options'. However, it is assumed that the regulatory model for 'Proposed Transport Corridors' (Schedule C, Part D, Clause (1) of SEPP(AQM)) is the EPA Victoria developed AUSROADS.

It is assumed that meteorological conditions as recorded at Moorabbin Airport are site representative of bayside conditions on the eastern shore of Port Phillip north of Frankston.

Ambient air quality (background) levels at Edithvale and Bonbeach are considered to be no higher than the levels recorded at any of Dandenong, Brighton, Westgate Freeway or inner Melbourne.

I have assumed that the train timetable supplied to me is a true reflection of diesel train movements on the Frankston line.

The freight diesel locomotive was assumed to be either an XR or BL class locomotive with a rated power output of 2460 kilowatts (3300 horse power).

I have assumed that all 248 submissions supplied to me contain all the relevant issues pertaining to my area of expertise.

(h) a statement setting out any questions falling outside the expert's expertise and also a statement indicating whether the report is incomplete or inaccurate in any respect.

Not Applicable

# Appendix B CV

# Barry Cook

## Principal meteorologist

**Qualified.** University of Melbourne. B.Sc (Hons) in meteorology and physics. Degree conferred 1983.

**Connected.** Member of Clean Air Society of Australia and New Zealand (CASANZ). Member of CASANZ Local Organising Committee for 2015 22nd International Conference. Certified Air Quality Professional of CASANZ.

**Relevance to project.** Barry is a Principal Professional in the Air and Noise and Meteorology Assessment team in GHD's Melbourne office. He has combined consulting, regulatory and industry experience with air quality modelling systems and assessments. His previous positions as a meteorologist at environmental consulting firms, EPA Victoria and Mount Isa Mines and his current position with GHD have provided him with over 35 years of experience.

**Air Quality Assessment**
**North East Link Authority | Melbourne, VIC, Australia**

Technical advisor role including EES and Works Approval Application. The impact assessment includes consideration of tunnel emissions and ventilation to the ambient environment as well as impacts nearby surface roads.

**Air Quality Assessment**
**Western Distributor Authority | Melbourne, VIC, Australia**

Technical advisor role including assessment of tenders. The impact assessment included consideration of tunnel emissions and ventilation to the ambient environment, construction dust and near-road dispersion from surface roads.

**Air Quality Assessment**
**Roads and Maritime Services | Sydney, NSW, Australia**

JV – WestConnex Tender. The impact assessment included consideration of tunnel emissions and ventilation to the ambient environment as well as construction impacts on dust dispersion.

**Air Quality Assessment**
**Roads and Maritime Services | Newcastle**

Newcastle Inner City Bypass between Rankin Park and Jesmond. Use of Screening Toolkit for air quality impact.

**Air Quality Assessment**
**Linking Melbourne Authority | Melbourne, Victoria, Australia**

East West Link Air Quality Assessment: Compilation of a Comprehensive Impact Statement (CIS) for vehicles travelling on the proposed East West Link.

**Air Quality Assessment**
**Linking Melbourne Authority | Melbourne, Victoria, Australia**

WestLink Air Quality Assessment: A detailed assessment, complying with regulatory guidelines, of possible design options was provided to the client.

**Project Engineers (D&C)**
**Transcity JV | Brisbane, Queensland, Australia**

Legacy Way - Legacy Way (formerly Northern Link). GHD assisted the constructor including assessing construction dust impacts.

**Air Quality Assessment**
**Linking Melbourne Authority | Melbourne, Victoria, Australia**

Frankston Bypass Project. Technical Study and report for EES. Development of metric of airshed emissions based on Vehicle Kilometres Travelled (VKT). Including presenting as expert witness to Planning Panels Victoria.

**Air Quality Assessment**
**VicRoads | Western Victoria**

Western Highway EES - 2 stages. Bypass highway duplication Beaufort to Ararat. Near-road impact assessment by consideration of transects of pollutant concentrations with distance from the highway.

**Air Quality Assessment**
**RTA (NSW) | Sydney**

M5East Portal Emissions. Traffic emissions were assessed and modelled.