

In the Environment Court of New Zealand  
Auckland Registry

I Mua I Te Kōti Taiao O Aotearoa  
Ki Tāmaki Makaurau

**ENV-2023-AKL-160**

Under the Resource Management Act 1991

In the matter of An application for a direct referral to the Environment Court under section 87G of the Act for an order granting the applicant's resource consent applications to construct and operate a new asphalt plant at 54 Aerodrome Road, Mt Maunganui, together with an application for consent to authorise the continued operation of the existing asphalt plant on the site pending construction of the new plant

Between **Allied Asphalt Limited**

Applicant

And **Bay of Plenty Regional Council and Tauranga City Council**

Consent Authorities

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**Statement of Evidence of Ilka Loubser**

27<sup>th</sup> February 2024

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**Counsel acting:**

Stephen Christensen

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## Qualifications and experience

- 1 My full name is Ilka Loubser.
- 2 I am currently the New Zealand National Sustainability Programme Manager for Fulton Hogan Ltd (FH), a large New Zealand owned multi-national roading and infrastructure company. I have held this position since April 2022.
- 3 Most of my role involves identifying and implementing decarbonisation initiatives across the New Zealand business, to meet FH's carbon reduction commitment of 30% reduction by 2030 and net carbon zero by 2050.
- 4 This work draws on my previous experience as a Chartered Accountant and Civil Engineer/Project Manager (see paragraph 7 for more detail), and my qualifications which include a MPhil in Engineering for Sustainable Development from the University of Cambridge in the UK.
- 5 Fulton Hogan currently owns and operates 15 asphalt plants and part-owns several additional asphalt plants throughout New Zealand in joint ventures (JV) with other companies. Allied Asphalt Limited (**Allied**) is one of these joint ventures. The operation of these asphalt plants contributes more than 15% of FH New Zealand's Greenhouse Gas (GHG) emissions, and as a result is a focus area of FH New Zealand's decarbonisation efforts and my role.
- 6 Some asphalt plant decarbonisation work I have been involved with to date includes:
  - Being part of an Energy Efficiency and Conservation Authority (EECA) co-sponsored asphalt and bitumen plant Energy Transition Accelerator (ETA) study undertaken by Beca in 2022. More details of this are provided in paragraph 19 below.
  - Working with FH New Zealand regions to identify and implement energy reduction strategies for various asphalt plants.
  - Undertaking research into alternative fuels by working with internal subject matter experts (SME) and supervising a Callaghan Innovation sponsored summer engineering student.
- 7 My previous work experience includes:
  - (a) Prior to taking-up the role as National Sustainability Programme Manager, I worked for large horizontal infrastructure companies in

New Zealand as a Chartered Accountant for more than 8 years and a Civil Engineer/Project Manager for more than 5 years.

- (b) My previous experience as a Chartered Accountant involved overseeing the financials of several asphalt plants. This allowed me insight into how asphalt plants operate and what factors influence a plant's energy use and GHG emissions, which grants me the ability to pro-actively identify decarbonisation opportunities.
  - (c) This role also equipped me with an understanding of asphalt plant manufacturing data and how to use this in mathematical modelling to analyse the effects on GHG emissions of different decarbonisation options, which was used as part of the Allied emissions plan.
  - (d) During my 5+ years as a Civil Engineer/Project Manager, I gained an in-depth understanding of the operational reality of managing a construction site, and what determines whether an initiative is operationally feasible or not. The experience I gained in this role and as a Chartered Accountant also enabled me to understand what determines financial viability of different initiatives.
  - (e) These two criteria (operational feasibility and financial viability) were used in the Allied Emissions Reduction Plan (**ERP**) to evaluate decarbonisation options and to deem whether they were included. This is consistent with the requirements under the National Environmental Standards for Greenhouse Gas Emissions from Industrial Process Heat Regulations 2023 (see paragraph 24 for more detail).
- 8 My role in relation to Allied's application for resource consents for a new asphalt plant, and the continued operation of an existing plant pending construction of the new plant, at 54 Aerodrome Road, Mt Maunganui (**Application**) has been to draft the ERP, which was provided with further information on 31 January 2024.
- 9 My assessment is based upon the project description provided in the planning evidence of Mr Craig Batchelar. Lower greenhouse gas emissions is one of several advantages identified for the new asphalt plant compared to the existing asphalt plant<sup>1</sup>.

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<sup>1</sup> Application Section 5.1 Overview.

- 10 In preparing this statement of evidence I have considered the following documents:
- (a) the statements of evidence on the details of the new proposed asphalt plant and the current asphalt plant at 54 Aerodrome Road, Mt Maunganui prepared by Brian Palmer and Jonathan Garton;
  - (b) the National Environmental Standards for Greenhouse Gas Emissions from Industrial Process Heat Regulations 2023;
  - (c) the asphalt and bitumen plant Energy Transition Accelerator Report (ETA) prepared by Beca for Fulton Hogan in 2022;
  - (d) the Bay of Plenty Regional Council and Tauranga City Council s87F report;
  - (e) the most recent conditions of consent proposed by Allied;
  - (f) submissions relevant to my area of expertise;

#### **Code of Conduct for Expert Witnesses**

- 11 I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2023 and that I have complied with it when preparing my evidence. Other than when I state I am relying on the advice of another person, this evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

#### **Scope of evidence**

- 12 I have prepared evidence in relation to:
- (a) GHG emissions sources of asphalt plants;
  - (b) GHG emission reductions for asphalt plants generally;
  - (c) preparation of the ERP for the Allied Asphalt Limited's asphalt plant at 54 Aerodrome Road, Mt Maunganui;
  - (d) the measurements and targets set out in the ERP;
  - (e) ERP review and endorsement
  - (f) matters raised by submitters on the Application;

- (g) matters raised in the Bay of Plenty Regional Council and Tauranga City Council s87F report; and
- (h) Proposed conditions of consent.

### **GHG emissions sources of asphalt plants**

- 13 Only Scope 1 and 2 emissions are considered in the ERP, where Scope 1 emissions are from sources that are owned and controlled directly by Allied such as fuel burnt, and Scope 2 emissions are caused indirectly by Allied and come from energy purchased and used such as electricity.
- 14 Scope 3 emissions, which is the emissions that are not produced by Allied, are not the result of activities from assets owned or controlled by Allied, but by third parties that Allied is indirectly responsible for up and down its value chain, are not included.
- 15 The Scope 1 and 2 GHG emissions of an asphalt plant are calculated by applying the Ministry for the Environment GHG conversion factors<sup>2</sup> to the plant's energy usage.
- 16 The vast majority of FH's owned, and JV asphalt plants use electricity to power most of the plant's operations such as conveyors and heating of stored bitumen. Natural gas, diesel, or waste oil is used as fuel for the aggregate dryer burner. The dryer burner fuel needs a high-calorific value fuel that allows immediate and intense process heat typically more than 170°C, to adequately dry and heat aggregate allowing it to be mixed with hot bitumen to produce asphalt. These requirements limit the types of fuel that can be used, with conventional fossil fuels such as natural gas, diesel and waste oil being preferred. Currently available technology does not allow electricity to be used for this purpose.
- 17 The fuel used for the aggregate dryer burner, generates by far the most Scope 1 and 2 GHG emissions. This is often over 90% of the plant's total as per previously calculations from FH internal work to characterise asphalt plant emissions.

<sup>2</sup> Ministry for the Environment (2023). *Measuring emissions: A guide for organisations: 2023 emission factors summary*.

## **GHG emissions reduction options for asphalt plants generally**

- 18 Because the vast majority of GHG emissions from asphalt plants are generated by the aggregate dryer burner, the most effective way to reduce Scope 1 and 2 GHG emissions from the asphalt production process is to reduce the amount, or change the type, of fuel used for this burner.
- 19 In 2022, Beca completed an EECA co-sponsored ETA study for FH, to identify decarbonisation options for FH's asphalt and bitumen plants. The study was led by Sarah Bacon, an industrial sustainability associate, and involved several FH and external SMEs. Three FH asphalt plants that are representative of FH asphalt plant size and type were considered in the study, with several decarbonisation options identified for each plant. These options were evaluated against criteria that assessed the forecasted cost and GHG emissions abatement potential, as well the technical and operational feasibility of each option.
- 20 The study's option evaluation was very detailed with mass-energy-balance calculations used to assess the energy use and hence GHG emissions, and first principle estimation to forecast the operational and capital cost. The technical and operational feasibility of options were assessed by reviewing the operations of the three case-study asphalt plants, and by the feedback provided from FH and external SMEs. Some assumptions were made in the study, mostly due to a lack of currently available information. These assumptions, and the various sources used in the study, were clearly stated and qualified by Beca.
- 21 Since the completion of the study, FH has implemented a number of these options at a national and plant-by-plant level. This mostly includes energy reduction initiatives as the study did not identify any currently viable alternative fuel options for FH New Zealand plants.
- 22 The current preference for fuel type is to use the lowest GHG emitting available fuel, which is natural gas. Other than that, FH is pro-actively continuing to research non-fossil fuels such as biomass and hydrogen, as it is recognised that this is a developing field with new information constantly being released through research and testing overseas. At the present time these emerging fuels, while showing promise for the future, are not commercially available.

## **Preparation of the ERP for the Allied asphalt plant**

- 23 The ETA study described above was used to create a list of energy reduction and alternative fuel options for the ERP, focusing on the aggregate dryer burner fuel.

- 24 There is not currently any New Zealand guidance available on the preparation of emissions plans, although Regulation 15 of the Resource Management (National Environmental Standards for Greenhouse Gas Emissions from Industrial Process Heat) Regulations 2023 lists matters that must be included in an emissions plan, and these were used to guide the content of this plan. Given that the regulations only came into force in July 2023, this was the first such plan prepared for Fulton Hogan, and our joint venture companies.
- 25 A key emissions reduction was the aggregate dryer fuel and GHG emissions savings from replacing the existing plant with a newer and more energy efficient model.
- 26 To the best of my knowledge, the list of options created from the above steps, and used in the ERP, includes all currently available options, as well as all that are foreseeable based on current knowledge in the industry, to reduce GHG emissions resulting from the burning of fuel to dry aggregate.
- 27 Each option's feasibility and financial viability was evaluated to determine whether it met the "currently practical" definition contained in the National Environmental Standards for Greenhouse Gas Emissions from Industrial Process Heat Regulations 2023. This process was informed by Beca's options evaluations completed during the ETA study, and by work subsequently undertaken by FH to implement energy reduction initiatives and to research alternative burner fuel options. A thorough explanation of the feasibility and financial viability evaluation of each option is provided in the ERP, with any assumptions used clearly stated. These evaluations use currently available information and to the best of my knowledge are fair and reasonable.
- 28 The options identified as currently feasible and financially viable, and hence currently practical were:
- (a) The energy efficiency savings provided by the new asphalt plant. The most significant GHG emissions reductions from the new plant include its use of a counter-flow instead of a parallel-flow arrangement in the aggregate drying drum which creates a superior heat transfer requiring less burner fuel, and the use of a batching system that reduces the amount of energy wastage.
  - (b) Installing aggregate bin covers that reduce the moisture content in the raw aggregate, and therefore the amount of heating and burner fuel required to dry it. Beca also evaluated this option in the ETA study and deemed it as practical. These bin covers have subsequently

been installed at several FH asphalt plants, with empirical evidence demonstrating real energy reduction.

- (c) Manufacturing asphalt at reduced temperature (i.e., less than 170°C). Reducing the final temperature of asphalt saves on aggregate heating and therefore burner fuel. FH previously made reduced temperature asphalt; however, the options rely on the asphalt plant customers accepting the product, which creates uncertainty in determining the likelihood of this option's success. A realistic assumption around the uptake of the product was made in the ERP and clearly stated. This will need to be revisited in five years and adjusted (if required) to include actual customer uptake or sales.
- (d) The most significant of the currently practical options is to use natural gas as the aggregate burner fuel for the new plant compared with waste oil which is used in the existing plant. Natural gas (as per the "Ministry for the Environment's Measuring emissions: A guide for organisations: 2023 emission factors summary" guideline) emits the least amount of GHG's per kilowatt-hour (kWh) of any currently available burner fuel. A supply of natural gas is available and is proposed to be installed to the new proposed Allied plant at 54 Aerodrome Road, Mt Maunganui as part of the development of the site. The use of natural gas is currently financially viable, however this will need to be monitored going forward, as there are external indications that the price of natural gas will continue to increase because of GHG emissions penalties and a reduced customer base. It is possible that the price could increase to an extent that natural gas is no longer financially viable. It is also possible that natural gas will not be readily available in the future as New Zealand transitions away from fossil fuels, which could mean the Allied plant may have to transition to another fuel type.

- 29 The GHG emission savings of the above options were calculated by comparing the existing plant at 54 Aerodrome Road, Mt Maunganui against the new plant. For the aggregate covers and reduced temperature asphalt options, the GHG emissions saving calculated by Beca as part of the ETA study were used. The GHG emissions savings from the energy efficiency of the new plant were calculated by comparing the known fuel burnt per tonne of asphalt produced by the current plant against the projected aggregate burner fuel use per tonne of asphalt produced for the new plant (based on figures provided by the manufacturer). A comparison between the GHG emissions of burning one kWh of waste oil (currently used) compared to natural gas was used to calculate the overall expected GHG emissions savings from this option. The conversion factors for natural gas



and waste oil from the Ministry for the Environment "Measuring emissions: A guide for organisations: 2023 emission factors summary" guideline were used.

- 30 The above options are available now and will be implemented with the commissioning of the new asphalt plant. The aggregate bin covers and natural gas options are expected to deliver immediate energy savings and hence GHG emission reductions compared to the existing plant. The energy efficiency from the new plant is expected to deliver savings shortly after the commissioning of the new plant as it requires operational adjustments to optimise the plant's energy use. The reduced temperature asphalt option will need to be developed in the coming years as it requires market demand for the product in the Bay of Plenty area. Hence, this could take several years before the full GHG emission savings forecasted in the ERP are realised.
- 31 The ERP also lists the GHG emission reduction options that have been identified but not deemed currently feasible or financially viable, with estimated dates when these options should be re-evaluated to see whether they have become feasible. For instance, some alternative burner fuel options such as biodiesel and hydrogen are very expensive and not currently financially viable, nor is sufficient supply available in New Zealand. These options also rely on technological research and development of aggregate dryer burners to allow the safe burning of these fuels. These options may become feasible and financially viable in future as supply becomes more readily available in the New Zealand market and technology develops. The review dates are estimates, based on our understanding of the current state of technology, and the speed at which we expect the technology to develop.

### **The measurements and targets set out in the Allied ERP**

- 32 The GHG emissions savings potential of all the currently feasible and financially viable options that will be implemented at the Allied site were added up, allowing for the compounding effects of undertaking multiple options at once, and specified as a kWh and GHG emissions value per tonne of asphalt produced by the new plant.
- 33 This value will be used as a benchmark to measure against and to ensure the emissions plan is executed fully. Regular monitoring will be undertaken of overall energy use, especially aggregate dryer burner fuel use, per tonne of asphalt produced for the new plant. It is expected that all other variables that influence energy use will be held constant or will be the same as the current plant. Therefore, it can be assumed that any reduction in energy

use and hence GHG emissions per tonne of asphalt produced will be due to the implementation of the ERP.

- 34 This new benchmark shows that the new plant will emit approximately 41% less GHG emissions per asphalt tonne produced than the existing plant.
- 35 This benchmark is expected to have a +/-10% confidence level due to the number and type of assumptions used in the Beca ETA study and the mathematical modelling used to derive the GHG emission reduction values of the various options.

#### **Allied emissions plan review and endorsement**

- 36 The ERP was reviewed and endorsed by Carl Newby, Director and Operations Manager of Emsol Ltd, who is a certified Process Heat Emissions Plan Reviewer, as required by the National Environmental Standards for Greenhouse Gas Emissions from Industrial Process Heat Regulations 2023. A copy of his letter of endorsement dated 22 January 2024 was included in the information supplied on 31 January 2024.

#### **Matters raised by submitters on the Application;**

- 37 I have considered the submissions of Jill Glazewski and Kim Davis, as these specifically address the GHG emissions of the new asphalt plant.
- 38 Both submissions raise concerns about the negative environmental effects from the GHG emissions generated from the operations of the new Allied asphalt plant. The ERP addresses these concerns by demonstrating that the new asphalt plant is using the best practicable option reduce the plant's GHG emissions as much as possible, and that the new plant will emit significantly less GHG emissions than the current plant.

#### **Matters raised by s87F report**

- 39 The s87F report does not require the preparation and submission of an emissions plan as part of the resource consent application. However, an ERP has been prepared and submitted in good faith to demonstrate that Allied is using the best practicable option to reduce the GHG emissions from the operations of the new plant, and that the new plant will generate significantly less GHG emissions than the existing plant.

#### **Proposed consent conditions**

- 40 I have reviewed the proposed resource consent conditions 11-14 and 38, and support these as being appropriate, as they relate to the GHG emissions of the new asphalt plant.

## Conclusion

- 41 An ERP was prepared as part of the resource consent application for the new Allied asphalt plant at 54 Aerodrome Road, Mt Maunganui, although this was not specifically required by Planning rules or regulations.
- 42 The process undertaken to draft the ERP followed best practice and was informed considerably by work previously undertaken by Beca as part of an asphalt plant Energy Transition Accelerator study.
- 43 The scope of the plan focused on Scope 1 and 2 GHG emissions generated by the asphalt production process and did not include any embodied emissions from materials used or from other operations such as transport. This scope was deemed appropriate as only Scope 1 and 2 emissions are directly controlled and influenced by the operation of the new plant. The ERP also focusses on the asphalt plant itself and does not consider other GHG sources on-site (for example vehicles operating on-site), given that this is the scope of the Resource Management (National Environmental Standards for Greenhouse Gas Emissions from Industrial Process Heat) Regulations 2023.
- 44 The focus of the ERP is to reduce to the amount of aggregate dryer fuel used, or change the type of fuel used, as this delivers maximum GHG emission savings.
- 45 Several options to reduce GHG emissions were identified and evaluated to determine whether the best practicable option has been implemented at the new asphalt plant. The National Environmental Standards for Greenhouse Gas Emissions from Industrial Process Heat Regulations 2023 definition of 'best practicable' was used, meaning that an option must be both feasible and financially viable to be practicable.
- 46 Four currently practicable options can be implemented upon the commissioning of the new plant, with most delivering immediate GHG emissions savings. The use of natural gas in the new plant compared to waste oil in the existing plant provides the most significant savings.
- 47 For options not deemed currently feasible, the emissions plan indicates when these options should be re-evaluated for practicality and which criteria need to be re-tested.
- 48 The GHG emissions reduction potential of the best practicable option were quantified and shows a 41% reduction in GHG emissions of the new plant compared to the existing plant.

- 49 To the best of my knowledge, all available GHG emission reduction options for the Allied asphalt plant were included in the emissions plan and evaluated fairly and reasonably.
- 50 The emissions plan was reviewed and endorsed by a suitably qualified reviewer as defined in the National Environmental Standards for Greenhouse Gas Emissions from Industrial Process Heat Regulations 2023.

A handwritten signature in black ink, appearing to read 'Ilka Loubser', with a long horizontal flourish underneath.

**Ilka Loubser**

Dated this 27<sup>th</sup> day of February 2024