Ref: 100202
2nd March 2019

Resene Paints Ltd
PO Box 38242
Wellington Mail Centre 5045

Attention: Neil Mora

Dear Neil,

Air Emission Testing Report

1 Introduction

Resene Paints Ltd (Resene) currently holds a resource consent for the discharge of contaminants to air (WGN160337 [34175]). As a condition of the resource consent Resene is required to undertake annual emission testing of their discharge to air. Conditions 9, 10, and 11 details the testing and reporting requirements. Condition 8 sets the discharge limit.

Emission testing was undertaken by Source Testing New Zealand Limited (STNZ) on the 31st January 2018. Resene has commissioned Brent Kennedy from Industrial Compliance Solution Ltd (ICS) to undertake a technical review of the emission testing results.

2 Consent conditions

The requirements of conditions 8, 9, 10 and 11 are present below.

Discharge limit

8. Notwithstanding conditions 1 and 3, discharges to air relating to the exercise of this consent shall not exceed the following concentrations from the paint production plant extraction systems as measured at the monitoring position on the stack:

- Total particulate: 10 mg/m3 (at STP, dry gas basis)
- Total VOCs (expressed as Toluene): 150 mg/m3 (at STP, dry gas basis)

The concentration shall be determined according to the requirements defined in condition 9 of this consent.

Air emission testing

9. The consent holder shall conduct an emissions testing programme annually for the first 5 (five) years of this consent within one month of the anniversary of the granting of the consent, and thereafter at intervals to be determined by consultation with, and to the satisfaction of, the Manager, Environmental Regulation, Wellington Regional Council; following assessment of the year 5 (2021) Air Emission Testing Report detailed in condition 11.

The emissions testing programme shall be to the satisfaction of the Manager, Environmental Regulation, Wellington Regional Council; and shall quantify the discharges of

particulates and VOCs from the plant. The consent holder shall ensure that the following contaminants will be sampled in the stack for:

- Total particulate and VOC concentrations from the stack (to be reported as mg/m³ for each sample and as a mean of all samples for each stack)
- Stack gas volumetric flow rate from each stack (to be reported at actual and standard conditions for each sample and as a mean of all samples for each stack)
- Stack gas velocity from each stack (to be reported at actual conditions for each sample and as a mean of all samples for each stack)

The mass emission rate shall be determined as the mean of a minimum of three samples, each collected as per the United States Environmental Protection Agency (USEPA) Test Method 5 and 18.

All sample results are to be corrected to zero degrees Celsius, one atmosphere pressure and on a dry gas basis.

Note 1: The discharge stack, including the monitoring positions, shall be as detailed in AQMP. No changes may be made without prior consultation with the Manager, Environmental Regulation, Wellington Regional Council. Any changes may require a variation to this consent or a new consent.

Note 2: Testing shall be carried out under conditions likely to generate the highest discharge of total particulate and VOCs.

Note 3: It is expected that AS/NZ or USEPA standards will be used for source emissions testing where they are available. Other guidelines/standards may be acceptable; however, the Manager, Environmental Regulation, Wellington Regional Council shall be consulted prior to using other standards.

Note 4: It is intended that the air emission testing shall occur annually, within one month of the anniversary of the granting of the consent, for the first 5 (five) years of the consent; thereafter the applicant shall motivate any changes from an annual testing regime.

10. All sampling techniques employed in respect of the conditions of this consent shall be to the satisfaction of the Manager, Environmental Regulation, Wellington Regional Council. All analyses shall be performed by an International Accreditation New Zealand (IANZ) registered laboratory or otherwise as specifically approved by the Manager, Environmental Regulation, Wellington Regional Council.

Air Emission Testing Report

11. Within two months of the completion of the emissions testing programme required in condition 9, the consent holder shall submit a report containing the results of the emissions testing programme to the Manager, Environmental Regulation, Wellington Regional Council. The report shall also contain data interpretation and analysis by a suitably qualified and experienced person and include comparison with the Assessment of Environmental Effects and the relevant guidelines. The report shall be to the satisfaction of the Manager, Environmental Regulation, Wellington Regional Council.

The report shall be accompanied by relevant production/chemical consumption data such that emission data can be correlated to production data. The data recorded shall include, but not be limited to:

- Paint production rates on a daily and monthly basis;
- Assessment against the maximum total particulate and VOC discharge limits defined in condition 8;

- Hours of operation of production on a daily and monthly basis); and
- Significant maintenance or upgrade items, including scheduled maintenance.

Should the report indicate that discharges differ significantly from those detailed in the Assessment of Environmental Effects submitted in support of the application, then the report shall contain recommendations for further mitigation of the discharges, a proposed timeframe for implementation of the recommendations, and recommendations for further monitoring should this be required.

> *Note 1: The report can be emailed to notifications@gw.govt.nz Please include the consent reference WGN160337 and the name and phone number of a contact person responsible for the discharge.*
>
> *Note 2: Any change from the location, design concepts and parameters, implementation and/or operation may require a new resource consent or a change of consent conditions pursuant to section 127 of the Resource Management Act 1991.*

3 Emission testing

3.1 Introduction

As required by conditions 9 and 10 of the resource consent, emission was undertaken by Source Testing New Zealand Limited (STNZ) on the 31st January 2019. The following test methods used are presented in Table 3-1 below.

Table 3-1: Summary of STNZ Test Methods

Contaminant	STNZ Standard Test Methods	IANZ Accredited
Sampling Points	Method 1 "Sample and Velocity Traverse for Stationary Sources"	Yes
Velocity & Volumetric Flow Rate	Method 2 "Determination of Stack Gas Velocity and Volumetric Flow rate (Type "S" Pitot Tube)"	Yes
Dry Molecular Weight Determination	Method 3 "Gas Analysis For The Determination Of Dry Molecular Weight	Yes
Moisture Content Determination	Method 4 "Determination of Moisture Content in Stack Gases"	Yes
Total Particulate Matter Determination	Method 5 "Determination of Particulate Emissions From Stationary Sources"	Yes
Determination of Volatile Organic Compounds	Method 18 'Measurement of Gaseous Organic Compound Emissions by Gas Chromatography"	Yes

STNZ is IANZ accredited for all the test methods as required by condition 10 of the resource consent.

3.2 Results

A summary of results from the January 2019 testing round are present below in Tables 3-2 and 3-3.

Results for PM_{10} are well below the 10mg/m3 (corrected to 0C, 101.3 kPa, dry gas basis) consent limit.

Table 3-2: PM_{10} results – January 2019

	Concentration - mg/m³ (corrected to 0C, 101.3 kPa, dry gas basis)	Consent limit - mg/m3 (corrected to 0C, 101.3 kPa, dry gas basis)

PM - Run1	<0.1	10
PM – Run 2	<0.1	10
PM – Run 3	<0.1	10

However, VOC results were higher than the 150 mg/m3 (corrected to 0C, 101.3 kPa, dry gas basis) (expressed as toluene). The average result was 486 mg/m3 (corrected to 0C, 101.3 kPa, dry gas basis) (expressed as toluene).

Based on these results an initial review of the operations for that day was undertaken. No unusual plant operating conditions were noted.

Table 3-3: VOC results – January 2019

	Concentration - mg/m^3 (corrected to 0C, 101.3 kPa, dry gas basis) (expressed as toluene)	**Consent limit - mg/m3 (corrected to 0C, 101.3 kPa, dry gas basis) (expressed as toluene)**
VOC - Run1	249	150
VOC – Run 2	285	150
VOC – Run 3	924	150

A copy of the emission testing report is presented in appendix A.

It was noted the temperature in the manufacturing area was warmer than previous years, with the average temperature of the extracted air being 33.3 °C. This is compared to 24.7 °C for December 2017 testing and 29.9 °C January 2018 testing.

3.3 Production data

During the January 2019 testing round the following products were being manufactured or canned.

Table 3-4: Products manufactured or canned

Products Manufactured	**Products Canned**
S/Gloss White	Auckland Drum Tractor B
A/Cote 210 Grey	Woodsman Wood Oil Stain
U/Cryl 403 UDB	Pal SJ Enamel Gloss Red
Woodsman Wood Oil Stain	Multi Grad GP 48 Black
IR132 BK2620 30% Sol	True Prime P/B
W/Primer Aluminium	Super Gloss Deep
Rali Reduced Str Tint Base	U/Cryl 400 Hardener
U/Cryl 400 Hardener	
IR26	

3.4 Changes to the process

There have been no changes to the production process which was described in the application AEE. However, there has been some changes to the extraction system with additional pick up points being added and mixing vats being fully enclosed and extracted.

4 Discussion

Results for the emission testing to date have demonstrated a high level of compliance with the PM_{10} discharge limit, which indicates the emission controls that are currently in place are more than adequate to control the discharge of particulate matter.

The results for VOCs have shown that the same level of control is not currently being achieved. The testing results are similar to the results of testing undertaken last year, which significantly different than the initial testing data collected for the resource consent application.

Similar observations have been made regarding the elevated temperatures within the plant during the emission testing periods, and for the summer period.

Again, this is likely to translates to a temperature increase within the production plant of greater than 10°C.

As discussed previously, these temperature increases when considered in relation to the solvents vapour pressure, will result in an increase in solvent vapours during normal production.

The current emission control design has no capacity to control the increased levels of solvent vapours present in the exhaust air discharge.

5 Conclusion

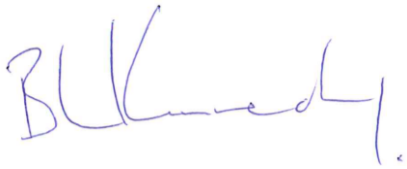
Emission testing results for VOCs has shown that concentrations within the exhaust air discharge have exceeded the resource consent limit. This is likely to be due to the increase in temperature within the manufacturing plant during the testing periods (greater than 10 degrees above outside temperatures).

As with the previous year, the 2018-2019 summer throughout New Zealand has been one of the warmest on record. These higher temperatures have resulted in an unforeseen increase in solvent vapour during the manufacturing process, which has caused levels of VOCs in the exhaust air discharge to be higher than the current consent limit. The current emission control system will not be able to control the increase in VOC emissions

An application to vary the current consent limits for VOCs and the supporting assessment of environmental effects is currently being prepared.

Industrial Compliance Solutions Ltd

Report prepared by:



Brent Kennedy

Principal Scientist

Appendix A: STNZ emission testing reports