



NOISE IMPACT ASSESSMENT
Craggs Ave, Clondalkin

Rp001 2021316 (Craggs Ave, Dublin)
14 January 2022

PROJECT: CRAGS AVE, CLONDALKIN

PREPARED FOR: MCARDLE DOYLE
2ND FLOOR
EXCHANGE BUILDING
THE LONG WALK
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REPORT NO.: RP001 2021316

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1.0 INTRODUCTION

Irwin Carr Ltd have been commissioned to undertake a noise impact assessment for an existing petrol station and associated structures at DCC Oil, Craggs Avenue, Clondalkin, Dublin

Dublin City Council have requested the applicant to submit a noise impact assessment that will demonstrate the unit will not be a nuisance to nearby residents.

The details of the requested information includes:

5. An acoustic assessment shall be undertaken by a suitably qualified acoustic consultant describing and assessing the impact of noise emissions from the proposed alterations to include the accumulative noise impact from existing on-site activities. The investigation shall include, but not be necessarily limited to, the following:
 - (a) The identification of any neighbouring noise sensitive receivers who may be potentially impacted by the proposal
 - (b) The identification of all operations conducted onsite as part of the development proposal that are likely to give rise to a public nuisance for the neighbouring noise sensitive receivers.
 - (c) Distances between the development and the nearest noise sensitive receiver and the predicted level of noise (L_{aeq}, 15min) from any development activities when assessed at the boundary of that receiver.
 - (d) An assessment of the existing background (LA₉₀,15 min) and ambient (L_{aeq},15 Min) acoustic environment at the receiver locations representative of the time periods that any noise impacts may occur. NOTE: For the purposes of the assessment background noise includes; noise of the surrounding environment excluding all noise sources currently located on-site.
 - (e) A statement outlining any recommended acoustic control measures that shall be incorporated into the development to ensure the use will not create adverse noise impacts on the occupiers of any neighbouring noise sensitive properties.

It is the purpose of this report to address the issues which may arise from the development and ensure noise requirements are met.

2.0 DEVELOPMENT DESCRIPTION

The site is located within the existing Clondalkin Industrial estate, and it is proposed that the fuel station will operate unmanned 24 hours per day.

The site is dominated by road traffic noise from the Clondalkin Industrial Estate and surrounding arterial routes in the locality as well as from the industrial activities ongoing in the estate.

The site location is presented in Appendix A along with the proposed layout of the site.

3.0 ASSESSMENT CRITERIA

There are two types of assessment criteria in relation to the predicted noise levels from this type of site. BS 4142:2014 is an assessment methodology that can be described as using noise change criteria, where the predicted noise levels are compared to the existing background noise levels.

Another method of assessment compares the predicted noise levels to absolute noise levels such as the World Health Organisation Guidelines, which outline absolute noise levels.

3.1 BS4142:2014

BS 4142:2014, *Methods for rating and assessing industrial and commercial sound*, describes methods for assessing whether noise levels are likely to give rise to an adverse impact by comparison of the background noise level with the noise emissions from the facility under assessment.

The Standard introduces the concept of a Rating Level (L_{Ar}) to account for the fact that certain characteristics of the noise source can increase the likelihood of an adverse impact. These characteristics include noise sources of an irregular nature or that contain distinguishable, discrete tonal noise.

Where applicable, a correction is added to the measured or predicted Specific Noise Level (L_{Aeq}) to determine the Rating Level. Note that all noise levels are assessed at an amenity area of the property under consideration.

BS 4142:2014 requires that the measured Rating Level (L_{Ar}) is compared to the Background Level (L_{A90}), measured in the absence of the noise under assessment, to determine the likelihood of an adverse impact. The greater this difference, the greater the likelihood of an adverse impact as follows:

- A difference of +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

3.2 World Health Organisation (WHO)

Example noise limits can be found in World Health Organisation (WHO) publication *Guidelines for Community Noise*, 1999 which states the following:

“To protect the majority of people from being seriously annoyed during the daytime, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB L_{Aeq} for a steady, continuous noise.”

and

“For a good night’s sleep, the equivalent sound level should not exceed 30dB(A) for continuous background noise, and individual noise events exceeding 45dB(A) should be avoided.”

4.0 ENVIRONMENTAL NOISE SURVEY

Noise levels were measured at the boundary of the between 7 January and 14 January 2022. The survey was set up using the following equipment:

- Larsen Davis 831 Sound Level Meter
- Larsen Davis Acoustic Calibrator

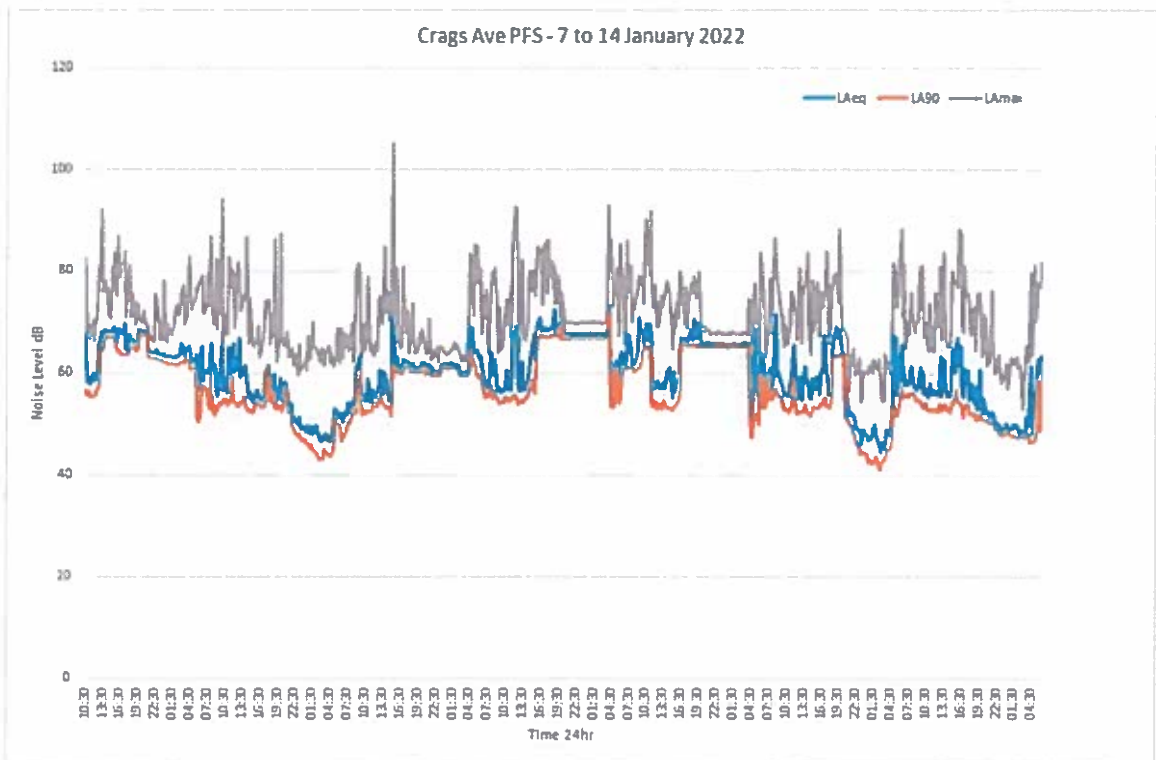
Table 1: Noise Monitoring Location

| | Location (Irish Grid) |
|---------------------------|-----------------------|
| Noise Monitoring Location | 707035, 732296 |

The acoustic parameters measured included L_{Aeq} , L_{A90} and L_{AFMax} . Instrumentation was checked calibrated before and after the survey period, with no deviation.

Figure 1 presents the results of the noise measurements over the 8-day survey period.

Figure 1: Acoustic survey time history

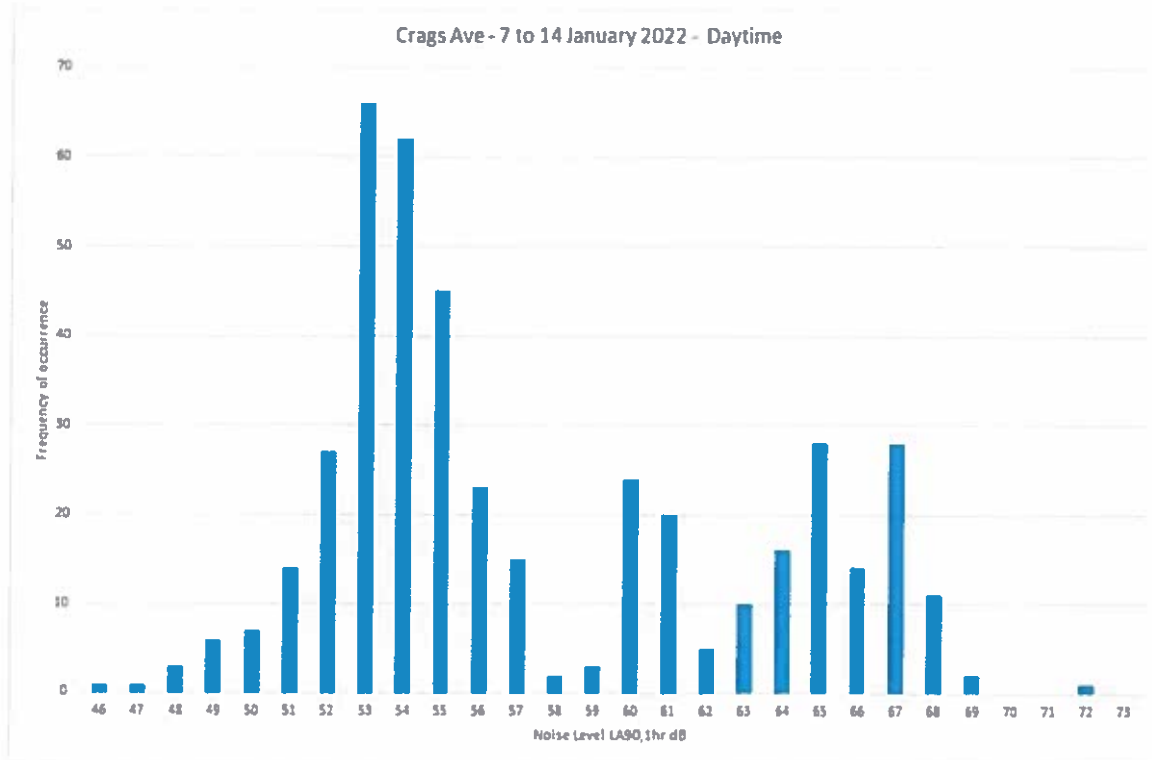


4.1 Background Sound Level

Background sound pressure levels were determined for the purposes of the BS4142 assessment. The standard uses a typical background level ($L_{A90, \tau}$) in the absence of the specific sound under consideration.

The daytime results are presented in Figure 2. Daytime background noise levels are from 07:00 to 23:00 every day.

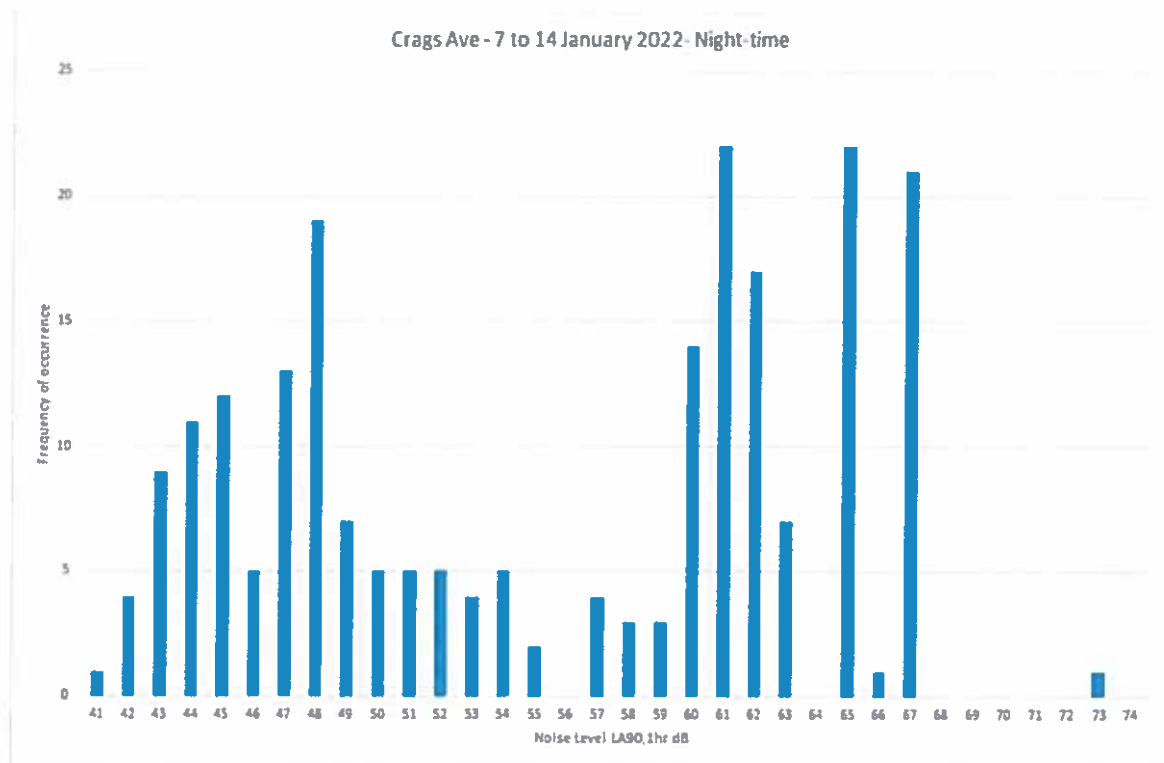
Figure 2: Histogram showing frequency distribution of daytime background sound levels



Based on analysis of the data presented in Figure 2, the average noise level of 57.5dB L_{A90} , the median level of 55dB L_{A90} and the modal level of 53dB L_{A90} and guidance from BS 4142:2014, 55dB L_{A90} has been chosen as the appropriate and representative background noise levels for the daytime period.

The night-time results are presented in Figure 3. Nighttime background noise levels are from 23:00 to 07:00 every day.

Figure 3: Histogram showing frequency distribution of daytime background sound levels



Based on analysis of the data presented in Figure 3, the average noise level of 54.2dB LA90, the median level of 54dB LA90 and the modal level of 61dB LA90 and guidance from BS 4142:2014, 48dB LA90 has been chosen as the appropriate and representative background noise levels for the daytime period.

5.0 NOISE PREDICTIONS

5.1 *SoundPLAN* Noise Modelling

For the purposes of this assessment, computer modelling has been undertaken to accurately predict noise emissions at the nearest residential properties due to the proposed development.

The model was implemented in *SoundPLAN* version 8.2, which is produced by Braunstein & Berndt GmbH. The *SoundPLAN* implementation of ISO9613 has been tested in-house by *SoundPLAN* developers to ensure calculated results are within 0.2dB of the standard.

The model is integrated, allowing noise from all sources, with prediction methodologies to be undertaken simultaneously. The noise model takes into consideration the following parameters:

- Topographical effects
- Atmospheric absorption
- Ground absorption
- Screening effects
- Reflections
- Focusing effects
- Metrological conditions

The model predicts the propagation of noise in each octave-band for source-receiver pair and produces a noise level contour map. The noise level contours are colour coded for ease of interpretation.

5.2 Source Noise Levels

The filling of cars and HGVs at the fuel pumps was assumed to be 85 dB(A) (Regional Institute for Environment, Hessen. Technical Report No. L4054. Investigation of noise emission and immission at petrol stations) with an on-time of 50% and all fuel pumps operating simultaneously during the daytime hours, with an on-time of 25% and all fuel pumps operating simultaneously during the night-time hours

HGV movements, assumed a sound power level of 98 dB(A) (BS5228:2014) with 4 movements per hour, travelling the full extent of the rear service area at 20 km/h during the daytime hours only.

5.3 Receptors

Three receptors were identified representing the nearest residential properties in the vicinity of the proposed development site. The location of these receptors is detailed in Table 3 and shown in Appendix A.

Table 2: Noise Sensitive Receptors

| Location | Co-ordinates |
|---------------------------|----------------|
| R1: Ballymanaggin Lane | 706906, 732260 |
| R2: Ballymanaggin Lane | 706907, 732262 |
| R3: Clondalkin Ind Estate | 706913, 732315 |

All of the properties are in the region of 100 from the proposed fuel pumps.

5.4 Predicted Noise Levels

The predicted noise levels (L_{Aeq} to the nearest dB) at each receptor location for each scenario are shown in Table 3.

Table 3: Predicted Noise Levels

| Location | Predicted Specific Noise Level (dB) $L_{Aeq, 1hr}$ | |
|----------|--|-----------|
| | Day time | Nighttime |
| R1 | 41.0 | 30.5 |
| R2 | 43.8 | 32.9 |
| R3 | 44.3 | 34.4 |

6.0 NOISE ASSESSMENT

6.1 BS 4142:2014 Noise Assessment

The predicted operations of the site have been assessed in accordance with BS 4142:2014.

- The highest predicted level is taken from Table 3 above
- The acoustic feature correction was assessed this takes account of:
 - Tonality – The noise sources associated are not inherently tonal;
 - Impulsivity – The noise sources associated are not inherently impulsive;
 - Other sound characteristics – There will not be a readily distinctive feature to the noise on the proposed site;
 - Intermittency – The fuel pumps may be considered intermittent, and a +3dB feature correction has been applied.

Noise from the proposed development will not add to the existing noise environment.

Table 4: BS4142 assessment

| Description | Daytime (typical) | Night-time (typical) |
|--|-----------------------------------|------------------------------------|
| Predicted source L_{Aeq} noise level | 44.3 dB | 34.4 dB |
| Acoustic feature correction | +3 dB | +3 dB |
| Rating Level, L_r | 47.3 dB | 37.4 dB |
| Background level (measured L_{A90}) | 55dB | 54dB |
| Difference | Rating Level = Background - 7.7dB | Rating Level = Background - 16.6dB |

BS4142 requires that the background noise level is subtracted from the Rating Level to identify the presence or otherwise of an adverse impact. The greater this difference, the greater the likelihood of an adverse impact as follows:

- A difference of +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

6.1.1 DAYTIME

The 'Typical' Rating Level is 7.7 dB lower than the daytime 'typical' background level at the nearest residential properties; this is an indication of the specific sound source having a low impact.

Furthermore, the maximum predicted absolute sound pressure level predicted at the closest receptor (42.7dB) is a minimum of 12.3dB below the WHO recommended higher external daytime noise level of 55dB L_{Aeq} .

6.1.2 NIGHT-TIME

The 'Typical' Rating Level is 16.6 dB lower than the Night-time 'typical' background level at the nearest residential properties; this is an indication of the specific sound source having a low impact at night.

The highest predicted sound pressure level at nearby residences is 33.5 dB $L_{Aeq, 15min}$ significantly under the existing ambient night-time noise levels (typically >50 dB(A)). Therefore, the development is considered to have a low noise impact at night.

7.0 CONCLUSION

A noise impact assessment has been carried out for a proposed fuel filling station and associated structures at DCC Oil Station, Craggs Avenue, Clondalkin, Dublin.

For this assessment, background noise levels were measured on the boundary the site between 7 January and 14 January 2022. The background noise level measured at this location was deemed representative of the background noise levels in the vicinity of the site.

The predicted noise levels at each of the nearest sensitive receptors were assessed against BS 4142:2014 limits and WHO recommended noise levels.

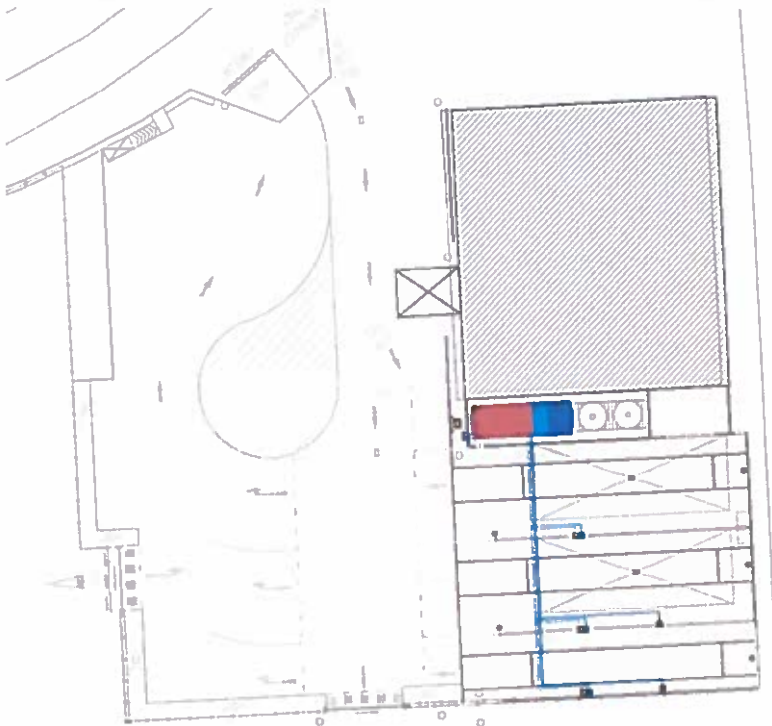
It was found that operational noise from the proposed development is likely to have a low impact during the daytime period.

For the reasons outlined within this report, Irwin Carr Consulting is of the opinion that noise generated by the proposed development should not adversely impact neighbouring properties and therefore should not be considered a negative determining factor when assessing this application.

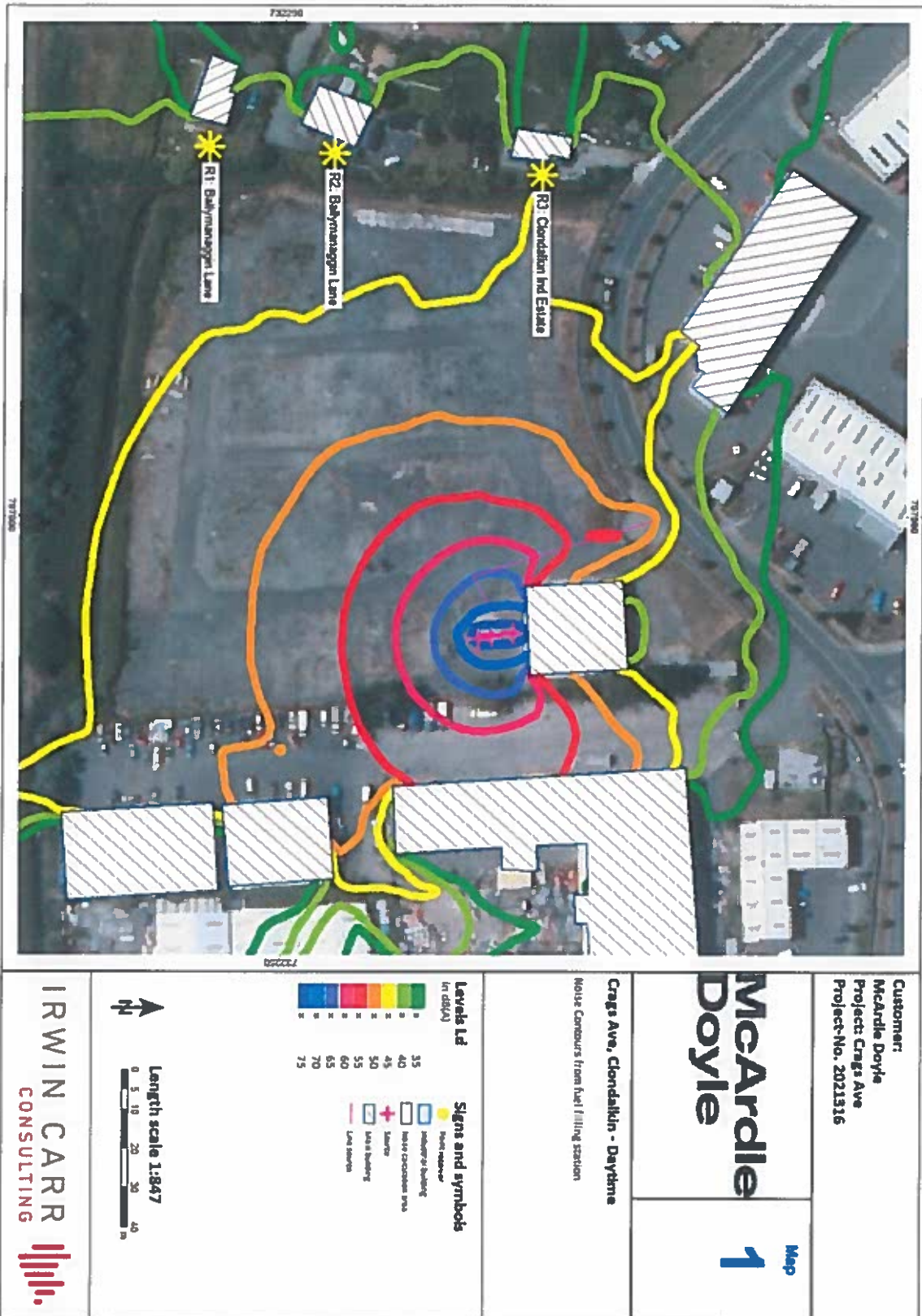
APPENDIX A SITE LOCATION AND NOISE MONITORING LOCATION

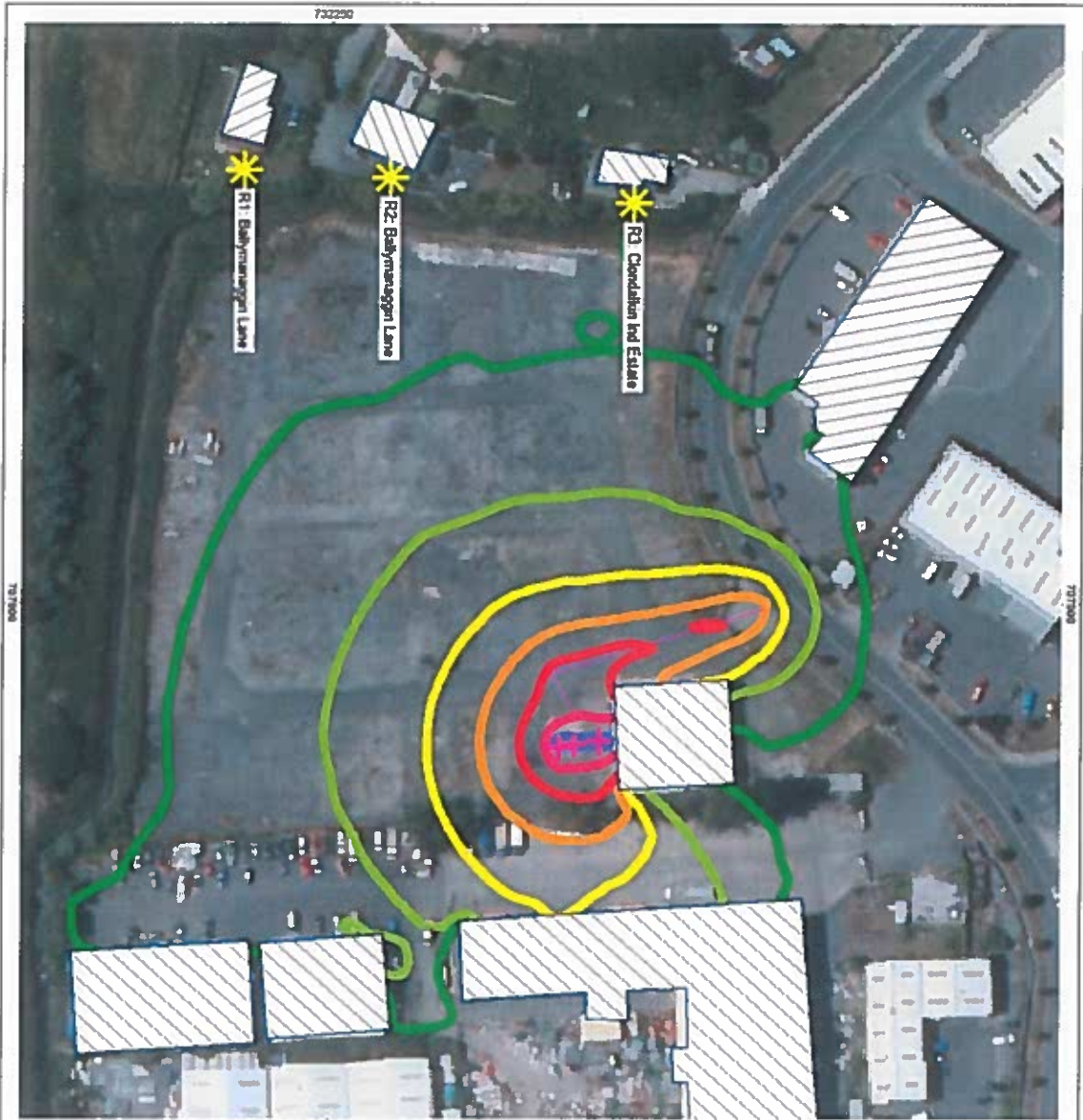


****Note- The above diagram is not to scale and is for illustrative purposes only**



APPENDIX B SOUNDPLAN NOISE MAP CONTOURS





Customer:
McArdle Doyle
Project: Craggs Ave
Project-No: 2021316

McArdle Doyle

Map 2

Craggs Ave, Clondalkin - Nighttime
Noise Contours from fuel filling station

