

24 September 2026

Central Otago District Council

C/- Emma Spalding
Taylor Planning

By email: emma.spalding@taylorplanning.co.nz

Dear Emma,

RC250077 Awa Koura Mining Limited – Review of Noise Effects

1.0 Introduction

Styles Group have been engaged by the Central Otago District Council (**CODC**) to provide advice on the Awa Koura Mining proposal at Sandy Point, southeast of Luggate and north of Queensbury (the **Proposal**).

The details of the proposal are set out in the Assessment of Environment Effects, the Revised AEE, RFI responses and associated application material available on the CODC website¹. This advice refers to that material collectively as the **Application**.

This advice focuses on the report prepared by Marshall Day Acoustics entitled “*Sandy Point Alluvial Gold Mine Noise Assessment*”², (the **MDA Report**) and the response to queries prepared by Marshall Day Acoustics dated 24 June 2026³ (the **MDA Response**) in response to my Request for Further Information dated 19 May 2026 (**RFI**). The MDA Response was supplemented by email with a clearer set of figures and three additional points of clarification. These are appended to this review as Appendix A. MDA also provided some further clarification by email on the 16th September. The clarifications are:

- 1) The noise contours in Appendix A of this review have an error in the title block where it states that they the contours are L_{Aeq} levels. The clarification email states that the contours are actually L_{A10} levels;
- 2) The noise contours in Appendix A of this review are not Noise Rating Level contours and do not incorporate any adjustment for Duration / Averaging in accordance with the relevant District Plan provisions and the New Zealand standards.

This review incorporates these clarifications.

¹ <https://www.codc.govt.nz/services/planning/b-notified-consents/current-publicly-notified-consents/rc250077-awa-koura-mining-limited-submissions-closed>

² *Sandy Point Alluvial Gold Mine Noise Assessment* Rp 001 20250974, 5 December 2025, Marshall Day Acoustics

³ *RC250077 Sandy Point Alluvial Gold Mine Request for Further Information – Noise* Lt 002 20250974, Marshall Day Acoustics

This advice is a review of the noise-related aspects of the Application and includes my comments on the likely noise effects and proposed conditions.

This advice follows the RFI questions and responses in the MDA Response and then concludes with comments on the potential noise effects and conditions.

Overall, the MDA Report and MDA Response provide a good description of the noise levels and effects although there are some aspects that I provide my own views on in this advice.

I consider that the technical noise modelling calculation methods, adoption of ISO and New Zealand standards and presentation of results is appropriate, subject to some minor comments in this review.

2.0 Relevance of permitted noise standards

The MDA Report and MDA Response adopt the noise standards for permitted activities as the measure of reasonableness for the noise effects. The MDA Report adopts the noise standards for permitted activities without qualification, but the MDA Response implies that the noise standards for permitted activities were adopted after an assessment of noise effects was conducted.

I understand that the Proposal requires consent as a Discretionary activity. As set out in my RFI, it is my experience that *“The noise standards for permitted activities were written to manage the effects of activities permitted in the zone – not activities that require consent, and especially not D or NC activities.”*

I do not consider that the MDA Response adequately justifies the adoption of the noise standards for permitted activities as the measure of reasonableness for the Proposal.

I consider that the noise effects should be considered against the relevant objectives and policies and against the timing, duration and character of the noise that could reasonably be expected in the zone. I consider that this is the case for receivers in the Queenstown and Central Otago Districts.

I address this in more detail later in this review when I address the potential noise effects.

3.0 Assessment of noise over vacant land

The RFI sought an assessment of noise effects over vacant land that could reasonably be developed as well as the assessment on dwellings that physically exist. This is necessary given that the District Plan noise standards in the Central Otago and Queenstown District Plans apply at any notional boundary. This includes notional boundaries that may physically exist and that may come and go over time.

I understand that there are some land parcels surrounding the Site that could be developed and that the likely development locations are the identified building platforms.

The MDA Response and updated figures in Appendix A of this evidence include all relevant / proximate existing dwellings and notional boundaries as well as the vacant building platforms that could be developed in the future.

The predicted noise level contours also provide a good indication of the likely noise levels across land that may be used by neighbours from time to time. The contours enable an assessment of effects over all parts of the surrounding properties.

4.0 Additional noise modelling locations

The RFI sought additional noise modelling of the mining activity in more locations to provide a better understanding of the noise levels and effects as the Proposal progressed along the mining area.

The MDA Response and the contours appended to this advice as Appendix A provides an adequate and clear response to the RFI. I consider that these contours and predictions are helpful to understand the likely noise levels as the mining progresses.

I note that there are some minor issues with the location of some receiver points in the updated contours. I have considered these and prepared my views based on aerial photographs in conjunction with the updated contours.

5.0 3360 and 3364 Luggate-Cromwell Highway

The RFI sought noise level predictions at two properties where none had been provided. I understand that the applicant has written approval from 3360 and 3364 Luggate-Cromwell Highway.

The MDA Response states:

“We have predicted the noise level at the notional boundary of the dwellings at 3360 and 3364 Luggate-Cromwell Highway. The predicted noise levels when mining activity is closest to these locations are 65 dB L_{A10} at 3360 Luggate-Cromwell Highway and 59 dB L_{A10} 3364 Luggate-Cromwell Highway. At these levels, noise from mining activity would be clearly audible over the existing ambient noise. Noise levels up to 65 dB L_{A10} have the potential to be highly annoying during outdoor activities.

However, we understand that a formal agreement (similar to an affected party approval) has been reached with these property owners, with the result that noise effects do not need to be assessed at these locations. We have acted on instruction of the project planner on this matter, and they will address this in their submission.”

It is my experience that a written approval only means that the *effects* on that person should be disregarded. It does not mean that the level of noise should not be reported and that consent is required to infringe the relevant District Plan rule if the level of noise exceeds the permitted standard.

The MDA Response sets out the predicted noise level at these two properties. The levels are considerably above the noise standards for permitted activities in the CODC District Plan. I expect that this will form a reason for consent. I understand that this has not been identified in the Application.

I have not assessed the effects at these properties.

6.0 Depth of working pit

The RFI states that the updated noise modelling (and as attached to this advice) has all the plant at ground level, rather than in a working pit. I understand that the plant could be at ground level at times and may be wholly or partly at some depth at other times. I consider it appropriate for the MDA Response to include noise level contours for when the plant is working at the surface, as they have done.

7.0 Noise level prediction methods

Section 5 of the MDA Report sets out how the noise level predictions have been prepared. The outputs of that process have been supplemented with the MDA Response and with the noise level contours appended to this advice as Appendix A. The most important additions in the MDA Response is to model the plant working at ground level and to provide modelling outputs for a greater number of mining scenarios.

I generally agree with the noise modelling methods, calculation algorithms, assumptions for meteorological conditions and the sound power levels for the various items of plant that have been modelled.

As set out in the introduction section, the Contours in Appendix A are predicted L_{A10} levels and not L_{Aeq} as set out in the title block.

8.0 Ambient noise level measurements

The MDA Report sets out the results of ambient noise measurements in its Section 4. The Measurement position was approximately 200m west of SH6. The MDA Report acknowledges that this position is relatively close to SH6 and that “...*ambient noise levels will potentially be lower at receivers on the eastern side of the Clutha River/Mata-Au.*”

Based on my visits to the area and on the proximity of roads and the river itself, (including the noise it generates) I consider that ambient noise levels will be lower for the receivers on the eastern side of the river. Below is my rationale for predicting what those lower levels are likely to be. In my view this information is important for assessing the potential noise effects of the Proposal.

The measured daily L_{Aeq} levels shown in Table 3 of the MDA Report average at approximately 50dB L_{Aeq} . My calculations of road traffic noise from SH6 are approximately 50dB L_{Aeq} for the

same time period (7am to 10pm).⁵ Based on this, I expect that the level of road noise from SH6 will be approximately 44dB L_{Aeq} during the day at receivers on the eastern side of the Clutha River approximately midway between SH6 and SH8A (such as 79 and 86 River Road). I expect that ambient noise levels may be similar to the MDA measured levels at receivers closer to the Clutha River due to the influence of the river itself and proximity to SH6.

Overall, I expect that the typical ambient noise levels in calm meteorological conditions will range from:

- 1) Receivers approximately 200m from SH6:
 - a. background L_{A90} levels of approximately 40 – 44dB
 - b. average L_{Aeq} levels approximately 48 – 50dB
- 2) Receivers further from SH6 (approx. 800m, such as 79 and 86 River Road):
 - a. background L_{A90} levels of approximately 34 – 38dB
 - b. average L_{Aeq} levels approximately 44 – 46dB

Based on the MDA measurements, my supplementary predictions and my knowledge of and experience in the area, I consider that these levels and the road traffic and river noise will mean that the area could not be described as tranquil or peaceful. Instead, I would describe it as area that is somewhat affected by road traffic noise (mainly) but to a reasonably minor degree.

The levels set out above describe the noise environment that is present for the majority of the time. There may be periods when it is a little quieter and there will be periods when seasonal or intermittent sounds from productive land use, construction, overhead aircraft and other seasonal or intermittent sources cause higher noise levels. However, these will generally be for short periods.

I consider that this assessment of the ambient noise environment is helpful for understanding the noise effects of the Proposal.

9.0 Noise effects of the Proposal

The Proposal is for mining over three years with the mining progressing from the southern end of the Site to the northern end over the three-year period. The noise contours in Appendix A of this advice (the **Contours**) demonstrate that the noise levels at any given receiver vary by approximately 10dB over that period.⁶

⁵ Approximately 4000 AADT, 9% HCV, 100km/hr, 200m separation distance and 90% of the traffic within the time period

⁶ This is approximate. Some receivers will experience a larger variation and others smaller.

9.1 General evaluation of effects

I have set out an approximate guide to the predicted noise levels and subjective nature of the effects for each scenario below. This assessment is for the physically existing receivers only – vacant / undeveloped land is addressed separately.

- 1) When mining is at the southern end, the noise levels will be approximately:
 - a. 45 – 50dB L_{A10} at the southern receivers,
 - b. 40 – 45dB L_{A10} at the central receivers,
 - c. 35dB L_{A10} at the northern receivers.
- 2) When mining is in the central area, the noise levels will be approximately:
 - a. 40 – 45dB L_{A10} at the southern receivers,
 - b. 45 – 55dB L_{A10} at the central receivers (55dB L_{A10} at 63 River Ridge Road, Scenario “Southern A”)
 - c. 35 – 45 dB L_{A10} at the northern receivers.
- 3) When mining is at the northern end, the noise levels will be approximately:
 - a. 30 – 45dB L_{A10} at the southern receivers,
 - b. 35 – 45dB L_{A10} at the central receivers,
 - c. 45 – 53 dB L_{A10} at the northern receivers.

The noise effects at these various levels can be described approximately as:

Receivers close to SH6 (within approximately 400m)

- **35 – 40dB L_{A10}** – generally below background and average L_{Aeq} levels. Mining noise unlikely to be audible except during very quiet periods of traffic.
- **40 – 45dB L_{A10}** – generally at or around background noise levels and slightly lower than average ambient levels. Mining noise may be audible when traffic noise is low.
- **45 – 50dB L_{A10}** – generally above background noise levels and consistent with average ambient levels. Mining noise will be audible much of the time but masked to some extent by passing traffic.
- **50 – 55dB L_{A10}** – 5 – 10dB above background noise levels and generally above average ambient levels. Mining noise will be audible most of the time.

Receivers remote from SH6 (further than approximately 400m)

- **35 – 40dB L_{A10}** – generally at or around background and below average ambient levels. Mining noise may be audible when traffic noise is low.
- **40 – 45dB L_{A10}** – generally above background noise levels and consistent with average ambient levels. Mining noise will be audible much of the time but masked to some extent by passing traffic.

- **45 – 50dB L_{A10}** – 5 – 10dB above background noise levels and generally above average ambient levels. Mining noise will be audible most of the time.
- **50 – 55dB L_{A10}** – 10dB or more above background noise levels and clearly and noticeably above average ambient levels. Mining noise will be audible and the dominant noise source when it is operating.

I expect that when mining noise levels are at or above 45-50dB L_{A10}, the mining noise will be dominant and will mask many of the natural sounds in the environment, including the Clutha River and birdsong, unless the birds are close-by. I expect that at these levels (or above), mining noise will be well above existing background traffic noise levels and will detract from the existing levels of amenity. The constant noise during mining will remove any periods of quiet or peacefulness⁷, particularly for receivers further from SH6.

It is difficult to accurately assess these effects at all receivers because there is no measurement data quantifying the background and ambient noise levels at all receivers. These levels and descriptions are approximations and should be treated as such. There may be times when noise levels from the proposal will be slightly higher or lower, and when ambient noise levels are higher or lower. However, I expect that the assessment above will adequately characterise the effects for the majority of time when meteorological conditions are calm or moderate.

9.2 Duration of noise effects

I consider that the receivers at the southern and northern ends of the Proposal may receive noise levels that approach the noise standards for permitted activities, but these will generally be over a short period. Assuming relatively linear progress of the mining, the worst of the effects at these receivers would likely last less than 12 months.

The receivers generally east and west of the central portion of the mining area are likely to receive the highest noise levels and for the longest duration. There are some variations, but it appears to me that assuming a linear mining progression, the central receivers may experience higher noise levels for more than a year and potentially up to two years.

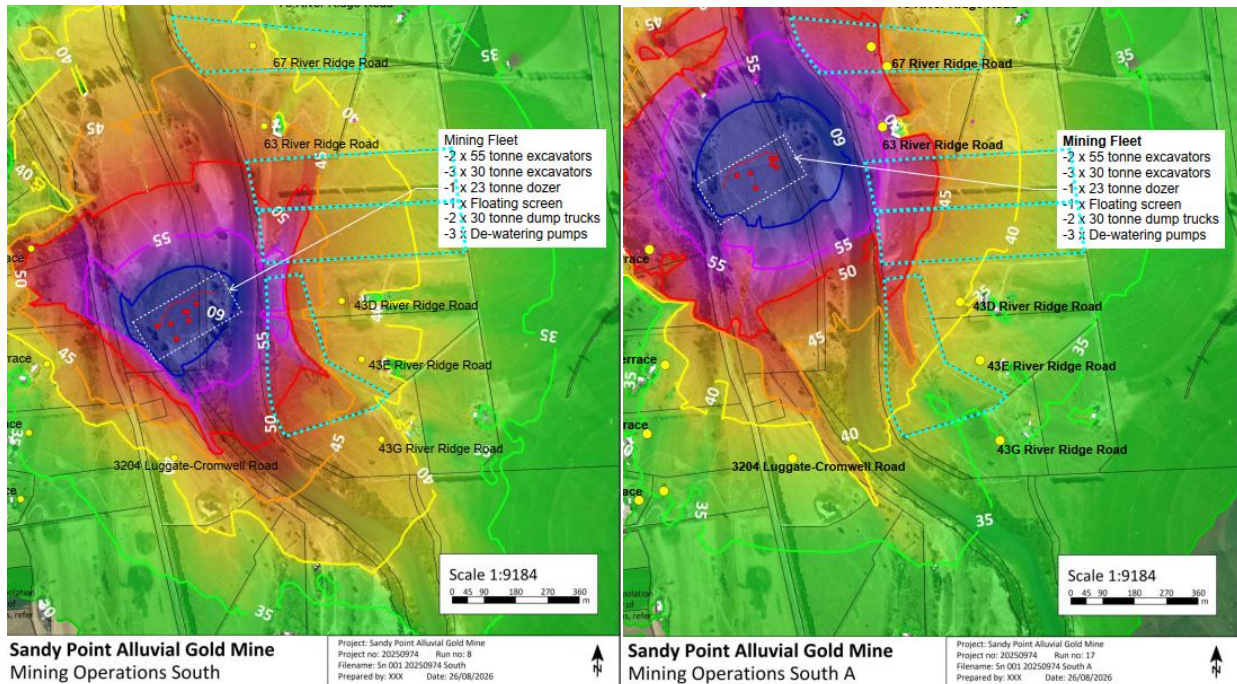
9.3 Noise effects over vacant sites

The MDA Response identifies that the noise effects of the Proposal will extend across four sites that do not have dwellings and notional boundaries on them. These properties are:

- 67 River Ridge Road
- 43B River Ridge Road
- 43C River Ridge Road
- Lot 4 DP 332902 Tarras-Cromwell Road (SH8)

The Contours do not specifically identify these sites. I have highlighted them with a blue dashed outline the two most-relevant Contour maps below:

⁷ I am not suggesting in this section that a sense of peacefulness is a reasonable expectation. This sentence is simply attempting to describe the effects of the sound of the proposal.



These Contour maps show the predicted noise levels across the vacant sites. There are small areas near the western extent of these sites where the noise levels are above the noise standards for permitted activities. The noise levels across the majority of these sites will be compliant.

The noise standards for permitted activities only apply if a house is constructed and occupied when the mining is underway.

I leave it to the Council to determine whether there is a reasonable risk that a new notional boundary could be constructed on any of these vacant sites in the western portion where noise levels could exceed the noise standards for permitted activities.

I consider that any risk of non-compliance arising from the establishment of a new dwelling should lie with the applicant / consent holder. I consider that if a new notional boundary is constructed and mining noise levels exceed the noise standards for permitted activities, the consent holder should have to reduce its noise emissions to comply.

9.4 Overall noise effects

I have read the assessment of noise effects set out in the MDA Report and MDA Responses. I do not agree with those assessments primarily because I consider they do not take into account or properly evaluate the relevant factors in this case. I consider that the MDA assessment of effects:

- is primarily benchmarked against compliance with the noise standards for permitted activities (where this proposal requires a Discretionary consent and a more holistic assessment of noise effects),
- takes into account the ambient and background sound levels, but only in a very basic way and without proper consideration of the effects at receivers where the ambient and background sound levels will be lower than those measured by MDA, and

- c) does not evaluate the acoustic amenity of the area or the noise-related expectations for the RRA as they are described by the District Plan.

The MDA Report refers to the guidance in NZS6802:2008 and the WHO Guidelines. I do not consider that this guidance is very relevant. The noise standards for permitted activities in the RRA of 55dB L_{A10} is slightly below the guidance set out in Table 3 of NZS6802:2008. That guidance states that daytime noise levels up to 55dB L_{Aeq} will provide for the “...*reasonable protection of health and amenity associated with use of land for residential purposes*...” That guidance is taken from the World Health Organisation guidelines. I consider that the guidance in NZS6802 and the WHO guidelines provides helpful context but is not determinative in this case. That guidance is based on dose-response curves and large-scale studies of people living in urban areas that are exposed to noise from transport infrastructure and industry. They do not provide relevant guidance on the amenity expectations set by the District Plan for the RRA.

I have evaluated the likely noise effects based on my discussions with the processing planner to understand the relevant District Plan provisions and to create some understanding of the amenity values in this part of the RRA to evaluate the effects against.

I understand from the Council that RRA provisions anticipate activities such as farming, horticulture, viticulture and forestry. These may generate noise levels up to the noise standards for permitted activities at times, but the effects are likely to be seasonal and intermittent. The noise effects are likely to be an issue for minutes or hours of a day through to potentially several days at a time. Forestry may generate temporary effects for longer periods (weeks or months) but there would likely be several years of respite between noisy events.

I understand that the RRA can be generally described as a zone that does not provide for or anticipate ongoing or constant noise from industrial processes (or processes with the same character) that affect land beyond its own site boundaries. I understand that there will certainly be activities in the RRA that will generate noise, but they will generally be seasonal or intermittent noise sources (such as from productive rural uses) or otherwise relatively small scale, and with low overall noise emissions. I consider that the noise environment in the RRA will generally have long periods of time free from anthropogenic noise, other than road traffic noise.

I consider that the proposal will have clear and noticeable noise effects on most of the receivers in the area. The mining noise is likely to be dominant over most other sounds in the environment. These will generally be limited to approximately 12 months for the worst of the effects and potentially up to two years for the receivers near the central part of the Site. The 3- year consent duration reduces the effects when compared to a permanent activity. I have described the subjective assessment of noise effects and their duration in sections 9.1 and 9.2 above. I consider that the proposal has the potential to detract from the acoustic amenity of the area for the duration that the activity generates noise levels above approximately 45-50dB L_{A10} , especially at receivers furthest from SH6. I consider that the timeframe for the highest effects is relevant to whether the noise levels are reasonable.

10.0 Submissions

I have read the submissions that raise noise and vibration. I consider that the MDA Report, MDA Response and my review addresses the concerns raised. I provide further comments to address specific points as follows:

- 1) Several submissions express concern that a +5dB adjustment for special audible character should have been applied to the predicted noise levels. My experience is that an adjustment for special audible character would not be warranted for the machinery and processes that are proposed. However, it is possible that the plant could exhibit special audible character from sources such as squeaking excavator tracks, tonal reverse alarms and slamming of truck tailgates or other impacts. I consider it critical that these are managed so they don't occur. If granted, I recommend a condition of consent to require an Operational Noise Management Plan (**ONMP**), with inclusion of a clear section that sets out how noise sources that may exhibit special audible character will be 'managed out'.
- 2) Several submissions raise rural character and amenity concerns. In simple terms they state that the existing rural character and amenity is suitable or desired, and that the proposal will detract from that (significantly). My experience is that rural character and amenity should be informed by the relevant District Plan provisions for the zone. The District Plan may anticipate and provide for activities that could be different (and subjectively less acceptable) that what might physically exist in an area. I address this in section 9. Overall, based on my assessment above, I agree with submitters that the predicted noise levels will detract from rural amenity.
- 3) Some submissions raise concerns about the noise effects on land that is outside any notional boundary and that might be used infrequently or for short periods. This includes river users, fishers, boaters and tourists. I agree that the Proposal is likely to significantly affect the noise environment in the vicinity of mining. I expect that the noise levels would be so great (55-65dB L_{A10}) that such areas would no longer be desirable for most recreational uses. These effects will be present for three years and only present during the working hours. These areas are outside the notional boundary areas that the District Plan standards are primarily concerned with.
- 4) Some submissions mention vibration. I do not expect that vibration will be perceptible at any of the neighbouring properties.

11.0 Summary

In summary:

Technical noise modelling methods: I consider that the calculation methods, adoption of ISO and New Zealand standards, and presentation of results in the MDA Report and MDA Response are appropriate, subject to minor issues set out in this advice.

Relevance of permitted noise standards: I consider that the adoption of permitted activity noise standards as a measure of reasonableness in the MDA Report is not appropriate for a Discretionary activity. Instead, I consider that the noise effects must be evaluated against relevant objectives and policies, as well as by assessing the timing, duration, and character of noise expected in the zone.

Updated Contours: The updated Contours provide predictions over surrounding land including at existing dwellings and across vacant sites. I have highlighted the vacant sites in this advice. The Contours enable an assessment of noise effects across these surrounding properties.

3360 and 3364 Luggate-Cromwell Highway: Predicted noise levels reach 65 dB L_{A10} and 59 dB L_{A10} , which are considerably above District Plan noise standards. The written approvals that have been provided for those properties mean that the noise effects must not be considered but does not remove the need for consent to infringe rules (and appropriate conditions to reflect that).

Noise effects of the proposal: Noise levels at individual receivers will vary by approximately 10 dB over the three-year period. Mining generating levels above 45–50 dB L_{A10} will dominate and mask many other natural sounds, and will detract from the acoustic amenity of the area.

Duration of noise effects: The greatest noise effects will generally last less than 12 months for northern and southern receivers, but central receivers may experience higher noise levels for more than a year and potentially up to two years.

Noise effects over vacant sites: Small areas in the west of four vacant sites (67, 43B, and 43C River Ridge Road, and Lot 4 DP 332902) show predicted noise levels exceeding permitted standards. I consider that any non-compliance risk from new dwellings being established in these areas must be managed by the consent holder.

Overall noise effects: I consider that the Application's noise assessment does not properly evaluate acoustic amenity or District Plan expectations for the RRA. I consider that the proposal has the potential to generate noise levels and effects that will detract from the amenity in the area for the period when mining noise levels are at their highest (around 45-55dB L_{A10}).

Submissions: I have read the submissions raising noise and vibration concerns. I consider that special audible character should be 'managed out' through an ONMP; vibration is not expected to be perceptible at neighbouring properties; and noise levels along the river (55–65 dB L_{A10}) will significantly affect recreational use during working hours for the three-year duration. I agree with many submissions on the effects on amenity.

Conditions: I consider if consent is granted, a range of consent conditions should be imposed. Recommended conditions are set out below.

12.0 Conditions

I consider that if granted, conditions of consent should be imposed to manage noise levels.

I consider that a specific condition of consent referencing (but not necessarily reproducing) Rule 4.7.6.E of the District Plan would be helpful to manage noise levels in the CODC area. Such a condition should require the activity to comply with the noise standards for permitted activities at

any notional boundary (that has not provided written approval for noise effects), whether it exists now or in the future. That is consistent with the Application, Proposal, MDA Report and MDA Response.

I consider that the same type of condition should be imposed to manage noise levels into the QLDC jurisdiction. The condition would likely need to set out the requirements of the relevant QLDC rule to require compliance with a noise limit of 50dB L_{Aeq} when assessed at the notional boundary of any dwelling (existing or future) in accordance with the requirements of NZS6801:2008 and NZS6802:2008.

Given that the Contours predict that compliance may be marginal at some receivers (including potential future dwellings), I consider that the conditions should include the need for an Operational Noise Management Plan (**ONMP**).

I consider that the ONMP should include the requirement for noise measurements when the activity commences so that the total noise level can be calculated and the measures required to achieve ongoing and consistent compliance with the noise limits can be determined. I can provide advice on the content of that condition separately if required.

I also consider that there should be a clear condition limiting the hours of work. I understand that the currently proposed hours of operation are for 10 hours per day from Monday to Friday.

I expect that these hours could be reduced to (say) 8 hours per day, but this may have the effect of prolonging the overall project (and therefore the noise effects).

I consider that the days and hours should be reduced to avoid the days and hours when amenity expectations are highest. I expect that this is likely to mean that there should be no works on weekends or on public holidays, and that work on weekdays should be restricted to between (say) 8am and 5pm.

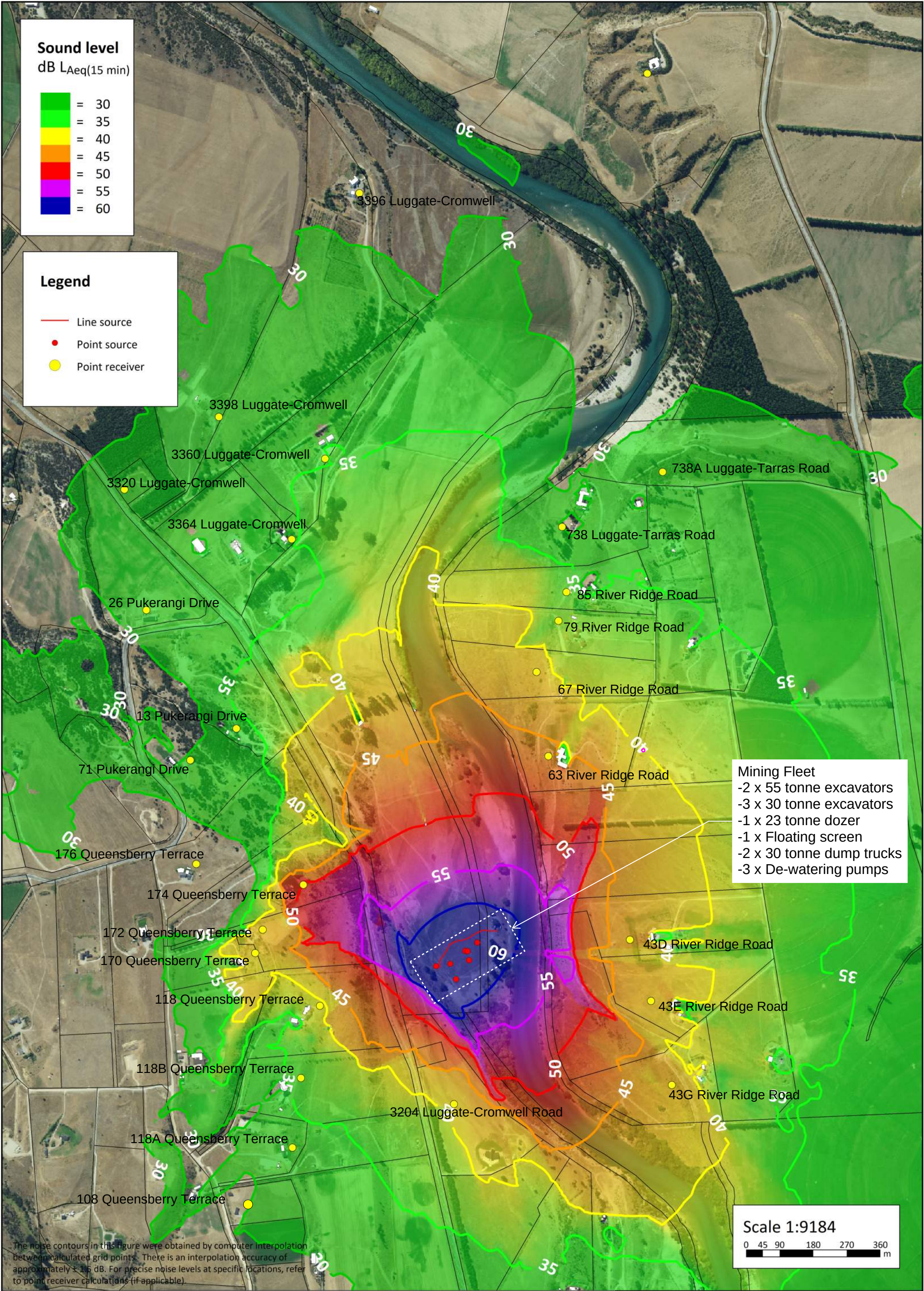
Please contact me if you require any further information.

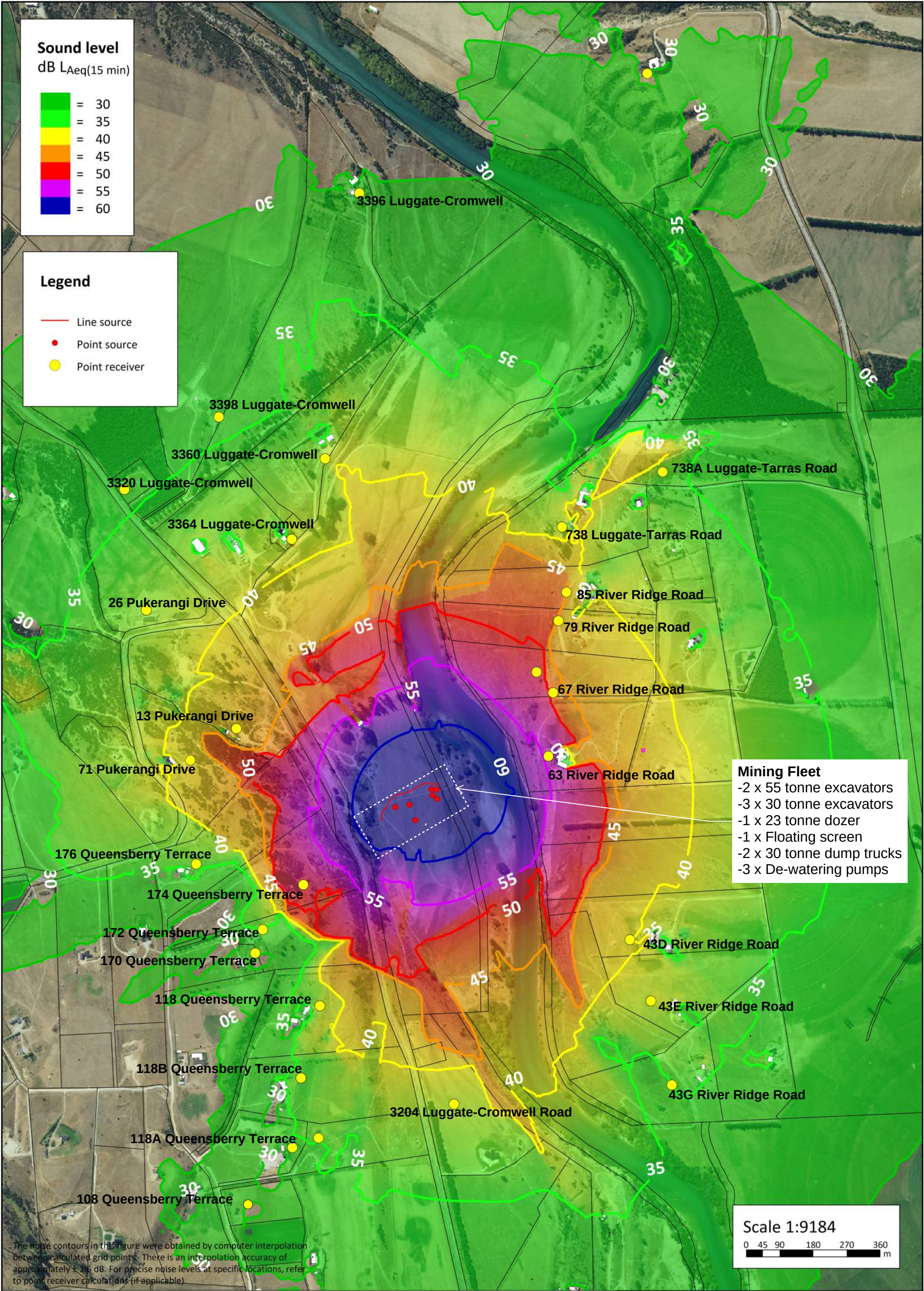
Yours sincerely,

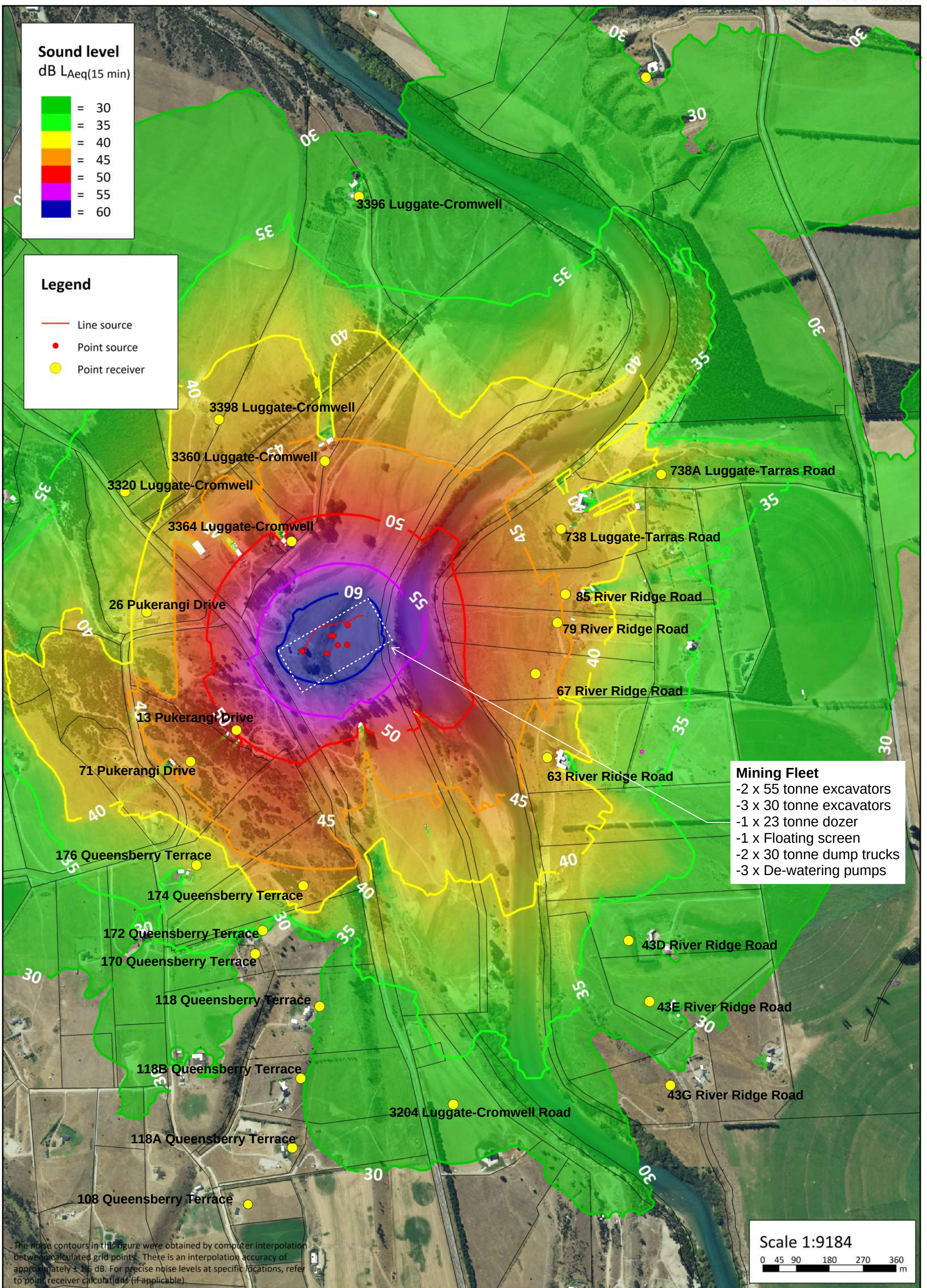


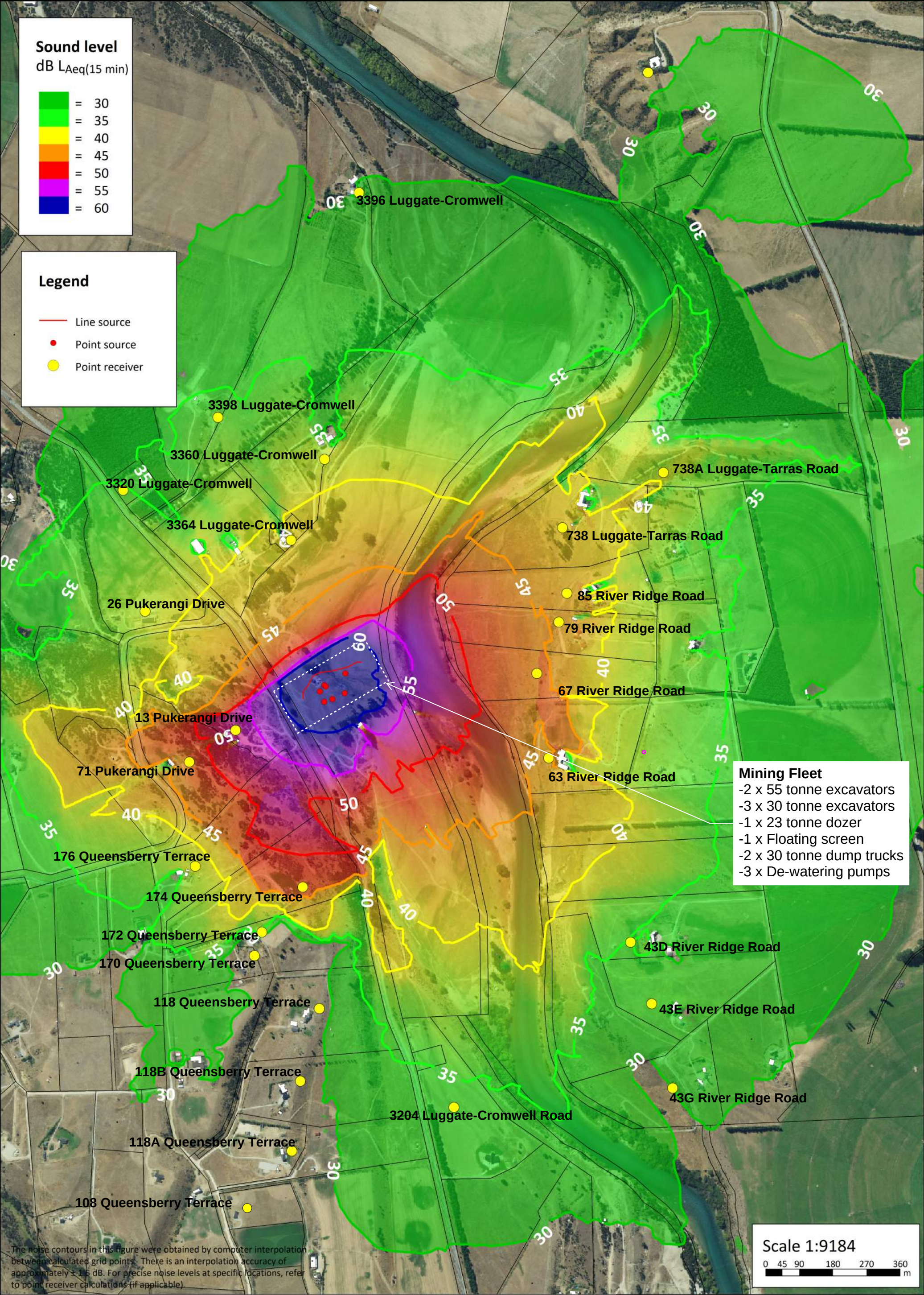
Jon Styles, MASNZ
Director and Principal

13.0 Appendix A – Contours provided to me by MDA (email 26.8.26)

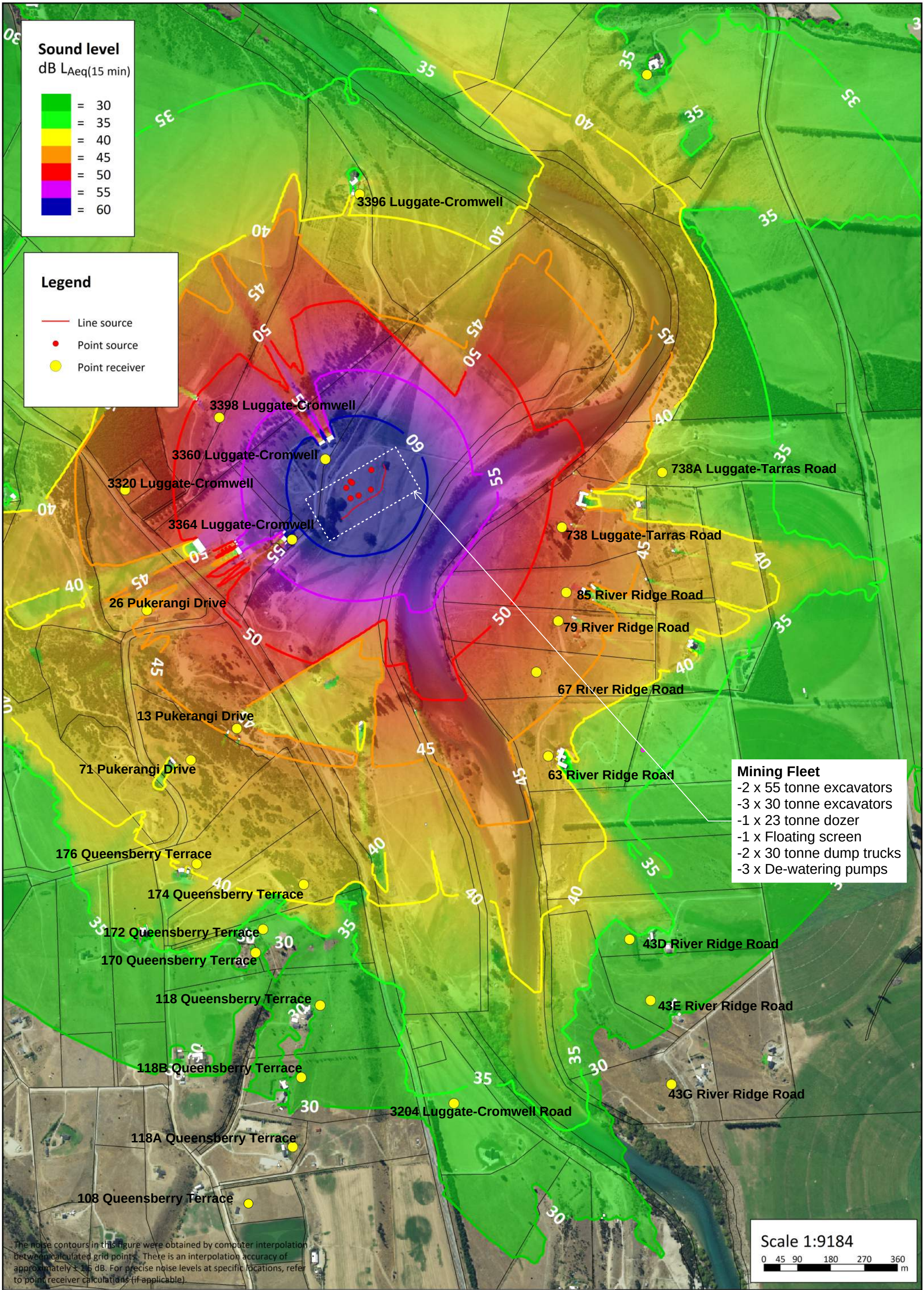




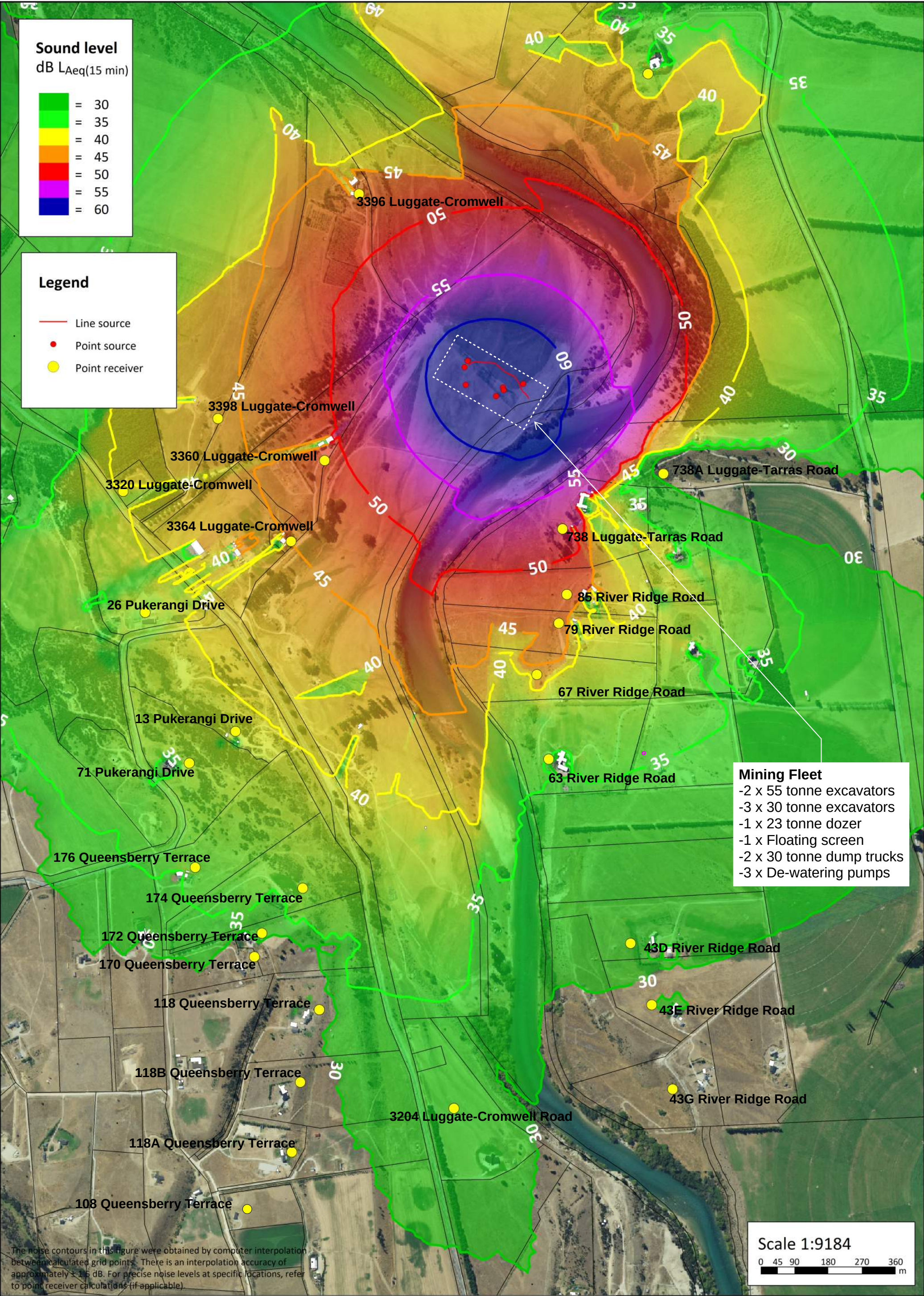


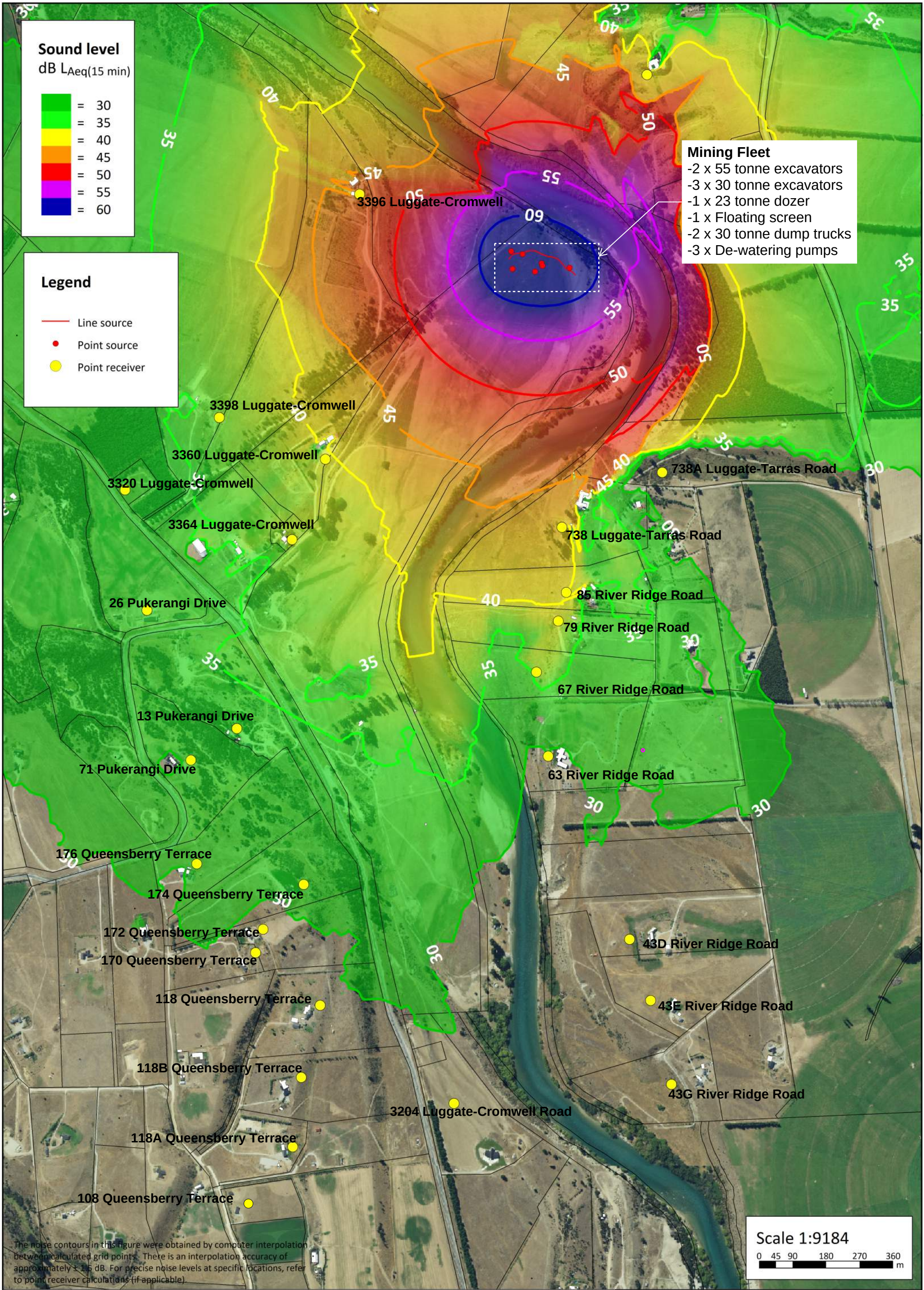


The noise contours in this figure were obtained by computer interpolation between calculated grid points. There is an interpolation accuracy of approximately ± 1.5 dB. For precise noise levels at specific locations, refer to point receiver calculations (if applicable).



The noise contours in this figure were obtained by computer interpolation between calculated grid points. There is an interpolation accuracy of approximately ± 1.5 dB. For precise noise levels at specific locations, refer to point receiver calculations (if applicable).





The noise contours in this figure were obtained by computer interpolation between calculated grid points. There is an interpolation accuracy of approximately ± 1.5 dB. For precise noise levels at specific locations, refer to point receiver calculations (if applicable).

