Appendix 8
Noise Assessment

CLIENTS | PEOPLE | PERFORMANCE

GHD Melbourne

Report on Coffs Harbour Water Treatment Plant

Noise Impact Assessment

May 2007

INFRASTRUCTURE | MINING & INDUSTRY | DEFENCE | PROPERTY & BUILDINGS | ENVIRONMENT

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Glossary

	Definition
dB	Unit of measurement for Sound Pressure Level.
dB(A)	Unit used to measure 'A-weighted' sound pressure levels.
L_N	Statistical sound measurement recorded on the linear scale.
L_{AN}	Statistical sound measurement recorded on the "A" weighted scale.
$L_{A10\ (Time)}$	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
$L_{A10\ (1\ hour)}$	The L_{A10} level measured over a 1-hour period.
$L_{A10\ (18\ hour)}$	The arithmetic average of the L_{A10} levels for the 18-hour period between 0600 and 2400 hours on a normal working day. It is a common traffic noise descriptor.
$L_{Aeq\ (Time)}$	Equivalent sound pressure level: the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring. This is considered to represent ambient noise.
$L_{Aeq\ (15\ hr)}$	The L_{Aeq} noise level for the period 7 am to 10 pm. (Day and Evening)
$L_{Aeq\ (9\ hr)}$	The L_{Aeq} noise level for the period 10 pm to 7 am. (Night)
$L_{Aeq\ (1\ hr)}$	The L_{Aeq} noise level for a one-hour period. It represents the highest tenth percentile hourly A-weighted L_{eq} during the period 7 am to 10 pm, or 10 pm to 7 am, (whichever is relevant).
$L_{A90\ (Time)}$	The A-weighted sound pressure level that is exceeded for 90 per cent of the time over which a given sound is measured. This is considered to represent the background noise e.g. $L_{A90\ (15\ min)}$
$L_{AMax\ (Time)}$	The maximum sound level recorded during a specified time interval.
$L_{AMin\ (Time)}$	The minimum sound level recorded during a specified time interval.
Noise Sensitive Place	*Noise sensitive place* means any of the following places: (a) A dwelling; (b) A library, childcare centre, kindergarten, school, college, university or other educational institution; (c) A hospital, surgery or other medical institution; (d) A protected area, or an area identified under a conservation plan as a critical habitat or an area of major interest, under the *Nature Conservation Act 1992*; (e) A marine park under the *Marine Parks Act 1982*; (f) A park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment.

	Definition
Rating Background Level (RBL)	The overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period (as opposed to over each 24 hour period used for the assessment background level). This is the level used for assessment purposes. It is defined as the median value of: All the day assessment background levels over the monitoring period for the day; (7 am to 6 pm); All the evening assessment background levels over the monitoring period for the evening; (6 pm to 10 pm) or All the night assessment background levels over the monitoring period for the night. (10 pm to 7 am).
Sound Pressure Level (SPL)	20 times the logarithm to the base 10 of the ratio of the RMS sound pressure level to the reference sound pressure level of 20 micropascals.

1. Introduction

GHD Pty Ltd has undertaken an acoustic assessment for the construction and operation phase components of a proposed water treatment plant (WTP) located near Coffs Harbour, NSW.

Based on the information provided, it is understood that a noise assessment is required to establish background noise levels and assist in the determination of project specific noise goals for construction and operational phases of the proposed development.

1.1 Site Description

The site is located within a rural environment, approximately 15 km west of Coffs Harbour. At the time of the assessment, it was understood the facility would principally consist of a flocculation and filtration concrete structure, one treated water pump station, sludge dewatering facilities with centrifuges and ancillary process equipment.

1.1.1 Hours of Operation

Normal construction hours are between 7:00 am to 6:00 pm Monday to Friday, and 8:00 am to 1:00 pm Saturday and at no time on Sundays and public holidays. Construction activity outside those hours is not preferred but can usually occur provided the normal operational noise criteria are met and construction noise is not substantially audible or intrusive inside a dwelling.

The hours of operation of the proposed facility are expected to be continuous.

1.1.2 Nearest Receivers

Noise sensitive receptors are generally defined as residential areas, hospitals, schools, caravan parks and other similar uses where people are present for an extended period of time.

Identified potentially sensitive locations within the vicinity of the proposed WTP are limited to sporadic rural lots, primarily located to the south and west of the site.

A site inspection indicated the nearest sensitive residential noise receivers are as follows:

- R1: Residential receiver approximately 100 m southwest from the proposed site;
- R2: Residential receiver approximately 270 m south from the proposed site;
- R3: Residential receiver approximately 180 m southwest from the proposed site;
- R4: Residential receiver approximately 190 m southeast from the proposed site; and
- R5: Residential receiver approximately 220 m southwest from the proposed site

These are shown in Figures in Section 4.

1.2 Scope of Work

The scope of work for this project is detailed below:

- Initial desktop review to identify key environmental noise catchment areas and noise sensitive receptors from aerial photography;
- Undertake unattended noise monitoring at the location of the nearest sensitive receiver to establish background noise levels;
- Based on monitoring results, establish project specific noise goals for the construction and operation of the WTP with consideration to the Environmental Noise Control Manual (ENCM) and NSW Department of Environment and Climate Change Industrial Noise Policy (INP);
- Identify the principal noise sources during the construction and site operation phases and their impacts at the nearest residence; and
- Determine the noise impact of the proposed operation at the nearest receiver and provide in principle noise control recommendations, if the results of the assessment suggest project specific noise goals may be exceeded.

Provision of a report including:

- A brief description of the project;
- A brief description of the ambient noise environment;
- Discussion of the noise impact results with relation to the adopted noise goals; and
- Mentioning of possible in-principle noise mitigation measures if the noise assessment suggests that project specific noise goals may be exceeded.

1.3 Limitations

This report has been prepared for Coffs Infrastructure Alliance. The purpose of the report is to provide an independent noise assessment on the construction works and operation of the proposed WTP.

It is not the intention of the assessment to cover every element of the acoustic environment, but rather to conduct the assessment with consideration to the prescribed work scope.

The findings of the noise assessment represent the findings apparent at the date and time of the monitoring and the conditions of the existing noise assessment undertaken. It is the nature of environmental assessments that all variations in environmental conditions cannot be accessed and all uncertainty concerning the conditions of the ambient noise environment cannot be eliminated. Professional judgement must be exercised in the investigation and interpretation of observations.

In conducting this assessment and preparing the report, current guidelines for noise were referred to. This work has been conducted in good faith with GHD's understanding of the client's brief and the generally accepted consulting practice.

No other warranty, expressed or implied, is made as to the information and professional advice included in this report. It is not intended for other parties or other uses.

2. Existing Environment

In order to establish background noise levels, unattended noise monitoring was undertaken at two representative locations within the vicinity of the proposed facility.

Unattended monitoring was undertaken using two EL 315 noise loggers, set to measure 15-minute data from 19 October to 26 October 2006.

Noise logging locations are shown in Figure 1.

No significant traffic or existing industrial noise sources were noted during field works. Occasional traffic flow and heavy vehicle pass-by associated with the adjacent substation and logging trucks were the primary influence to ambient the ambient noise profile.

Figure 1 Noise Logger Location and Proposed Site Layout

2.1 Noise Monitoring Results

Figure 2 and Figure 3 provide a graphical summary of the long term noise monitoring conducted at the sites of Loggers 1 and 2.

Figure 1 15-Minute Statistical Noise Logger 1

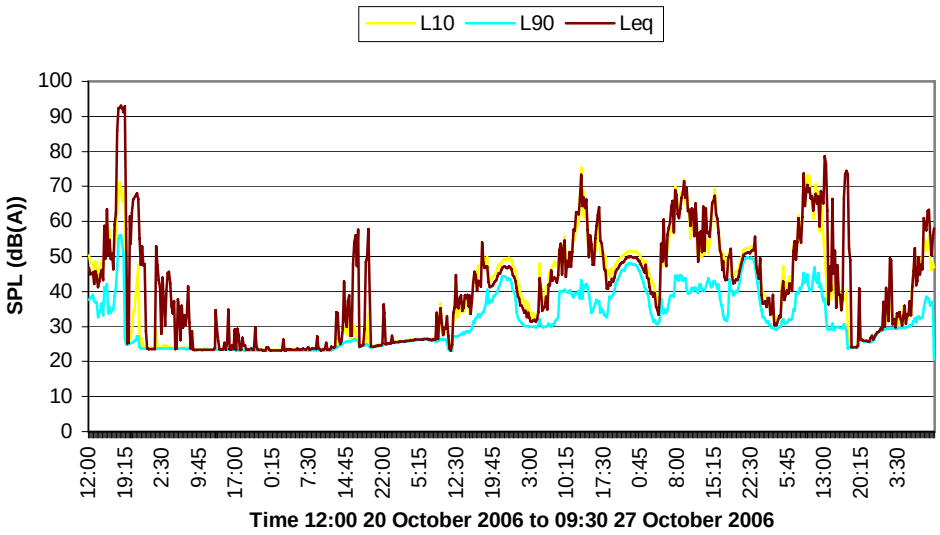

Figure 2 15 Minute Statistical Noise Results Logger 1

Figure 2 15-Minute Statistical Noise Logger 2

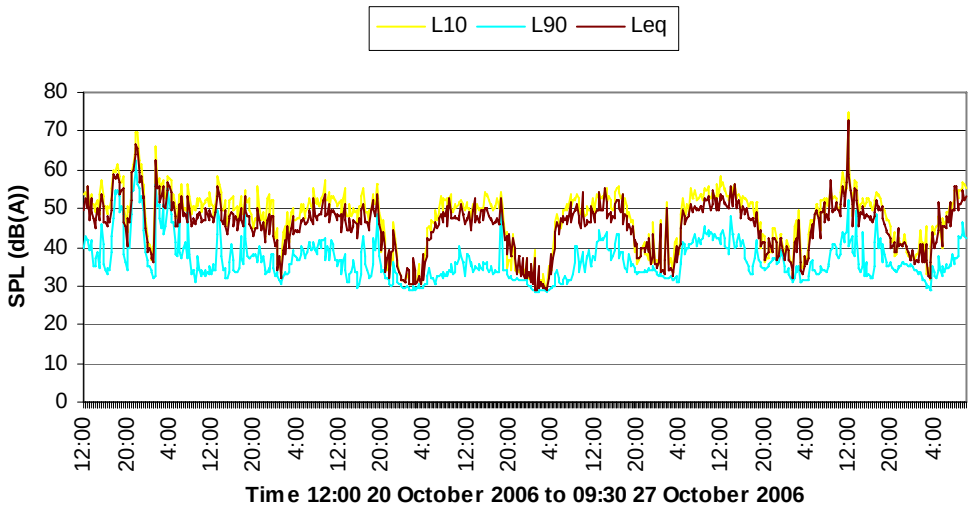

Figure 3 15 Minute Statistical Noise Results Logger 2

Long-term noise monitoring and attended observations indicate an ambient noise environment that is primarily described by natural sources such as wildlife with intermittent contributions from man made sources such as traffic and vehicles associated with the adjacent substation, cattle transport and logging.

A period of low (20 – 30 L_{eq} dB(A)) levels were recorded during the night time period of the 22/23 October at Logger 1. This is likely due to the location of the noise logger, which is positioned further from Upper Orara Road than Logger 2, therefore limiting potential road traffic noise.

Calculated background L_{A90} day, evening, and night for the monitoring period are provided in Table 2.1 and Table 2.2.

Table 2.1 Noise Monitoring Results – Background L_{A90} Noise Levels at Logger 1

Date	Day 7 am to 6 pm	Evening 6 pm to 10 pm	Night 10 pm to 7 am
20/10/06	33.8	24.9	-
21/10/06	23.2	23.2	23.7
22/10/06	23.2	24.1	23.2
23/10/06	25.5	36.8	25.1
24/10/06	32.3	38.3	29.9
25/10/06	34.3	39.6	31.6
26/10/06	29.1	24.0	29.6
27/10/06	-	-	27.7
Rating Background Level	**29**	**25**	**28**

- Indicates that no measurements were taken during these time periods.

Table 2.2 Noise Monitoring Results – Background L_{A90} Noise Levels at Logger 2

Date	Day 7 am to 6 pm	Evening 6 pm to 10 pm	Night 10 pm to 7 am
20/10/06	34.4	37.3	-
21/10/06	32.6	36.0	34.7
22/10/06	32.2	30.6	32.4
23/10/06	33.0	31.4	29.2
24/10/06	33.3	33.4	28.7
25/10/06	35.2	34.6	31.7
26/10/06	32.8	34.2	31.3
27/10/06	-	-	30.3
Rating Background Level	**33**	**34**	**31**

- Indicates that no measurements were taken during these time periods.

3. Noise Criteria

3.1 Construction Noise Criteria

Criteria for the construction phase applied to the assessment were sourced from Section 171 of the ENCM. The criteria was established using the measured background noise levels and applying a conversion factor based on the expected construction period. Construction noise criteria based on Table 2.1 and Table 2.2 background noise levels, are shown in Table 3.1.

Table 3.1 Construction Noise Criteria

Construction Period	Level Restrictions	Logger 1 L_{A10}	Logger 2 L_{A10}
Less than 4 weeks	Background + 20 dB(A)	50*	53
Less than 26 weeks	Background + 10 dB(A)	40*	43
More than 26 weeks	Background + 5 dB(A)	35*	38

*Note – The INP states that where the rating background level is found to be less than 30 dB(A), then it is set at a minimum of 30 dB(A), therefore these values have been adjusted to 30 dB before assessment with the construction criteria.

Since the construction period is expected to continue for longer than 26 weeks, 35 dB(A) will be adopted as the project specific noise goal.

3.2 Operational Noise Criteria

The NSW INP provides guidance on the assessment of operational noise impacts. The guidelines include both intrusive and amenity criteria that are designed to protect receivers from noise significantly louder than the background level and to limit the total noise level from all sources near a receiver.

Intrusive noise limits set by the INP control the relative audibility of operational noise compared to the background level. Amenity criteria limit the total level of extraneous noise. Both sets of criteria are calculated and the lower of the two in each time period normally apply. Table 2.2 in the INP provides modifications to the amenity criteria for existing levels of rural noise.

Attended observations noted industrial noise was not a significant contributor to the existing ambient noise levels in the vicinity of the proposed WTP, therefore no Table 2.2 adjustments are necessary for the amenity noise criteria. Intrusive criteria are simply 5 decibels above the measured (or adopted) background level with a minimum of 35 dB(A).

The rating background level (RBL) is the level used for assessment purposes. Where the rating background level is found to be less than 30 dB(A), then it is set to 30 dB(A).

Amenity criteria are determined based on the overall acoustic characteristics of the receiver area and the existing level of noise excluding other noises that are uncharacteristic of the usual noise environment. Residential receiver areas are characterised into 'urban', 'suburban', 'rural' or other categories based on land uses, the existing level of noise from industry, commerce, and road traffic.

The NSW INP states that the "primary means for identifying the type of receiver is how the receiver area is zoned in the relevant planning instrument". As the site is zoned 1(A) – Rural Agriculture under the Coffs Harbour City Council LEP (2000), the site is therefore considered to be assessed as a 'rural' setting.

The INP specifies that a rural area may be located in either a rural, rural-residential, environment protection zone or scenic protection zone, as defined by an LEP or other planning instrument.

The project specific noise levels are provided in Table 3.2.

Table 3.2 Project Specific Noise Levels

	Logger 1 (near substation)			**Logger 2 (near Upper Orara Road)**		
Criterion	**Day 7 am to 6 pm**	**Evening 6 pm to 10 pm**	**Night 10 pm to 7 am**	**Day 7 am to 6 pm**	**Evening 6 pm to 10 pm**	**Night 10 pm to 7 am**
A: Rating Background Level	29* $L_{A90(day)}$	25* $L_{A90(evening)}$	28* $L_{A90(night)}$	33 $L_{A90(day)}$	34 $L_{A90(evening)}$	31 $L_{A90(night)}$
B: Intrusiveness Criteria (A + 5dB)	35 $L_{Aeq(15min)}$	35 $L_{Aeq(15min)}$	35 $L_{Aeq(15min)}$	38 $L_{Aeq(15min)}$	39 $L_{Aeq(15min)}$	36 $L_{Aeq(15min)}$
C: Rural Amenity Criteria (Table 2.1 INP)	50 $L_{Aeq(day)}$	45 $L_{Aeq(evening)}$	40 $L_{Aeq(night)}$	50 $L_{Aeq(day)}$	45 $L_{Aeq(evening)}$	40 $L_{Aeq(night)}$
D: Amenity Criteria: (INP Table 2.2 Adjusted)	50 $L_{Aeq(day)}$	45 $L_{Aeq(evening)}$	40 $L_{Aeq(night)}$	50 $L_{Aeq(day)}$	45 $L_{Aeq(evening)}$	40 $L_{Aeq(night)}$
E: Project Specific Noise Level (Pg 21 INP)	**35 $L_{Aeq(15min)}$**	**35 $L_{Aeq(15min)}$**	**35 $L_{Aeq(15min)}$**	**38 $L_{Aeq(15min)}$**	**39 $L_{Aeq(15min)}$**	**36 $L_{Aeq(15min)}$**

*Note – The INP states that where the rating background level is found to be less than 30 dB(A), then it is set at a minimum of 30 dB(A), therefore these values have been adjusted to 30 dB for further calculations.

4. Noise Impact Assessment

4.1 Noise Model Configuration

Acoustic modelling was undertaken using Computer Aided Noise Abatement (Cadna-A) to predict the effects of industrial noise generated by the proposed site construction and operational activities.

Cadna-A is a computer program for the calculation, assessment and prognosis of noise exposure. Cadna-A calculates environmental noise propagation according to ISO 9613-2 and road traffic noise according to the Calculation of Road Traffic Noise (CoRTN), which was developed by the UK Department of Transport. Local topography, ground absorption and shielding objects are taken into account in the calculations.

Modelling results are based on available information provided and should only be used as a guide for comparative purposes.

4.1.1 Ground Contours

In the absence of directly importable topographical data (eg DXF File), ground contours were manually generated in the model based on local topographical maps.

4.2 Construction Noise

4.2.1 Noise Sources

A detailed list of construction equipment and a timeline of events was supplied by the client for the construction phase of the development. Using these details, typical noise levels produced by each item anticipated to be used on site were sourced from *AS 2436 – 1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites* and from GHD's internal database.

Modelled sound power levels for construction are shown in Table 4.1.

Table 4.1 Construction Equipment Sound Power Levels L_w dB(A)

Item	L_w dB(A)	Relative height (m)
Bobcat	112	1.5
Bulldozer	117	1.5
Chainsaw	102	1
Compactor	114	1
Concrete mixer	117	2
Concrete pump	114	2
Concrete vibrator	108	2
Crane, Derrick	118	2
Crane, Mobile	110	2
Excavator	114	2
Grader (G12)	114	2
Large Truck	103	3
Mulcher	98	3
Roller	106	2
Scraper	112	2

The sound power levels shown in Table 4.1 are maximum levels produced when machinery is in operation under full load.

4.2.2 Modelled Scenarios

The construction phase of the development was modelled under neutral meteorological conditions only.

4.2.3 Modelling Assumptions

From information provided by the client, it was found that the majority of significant construction works would take place in the first two phases of the construction plan. The equipment use during these two phases was estimated and the appropriate proportions of operating times assigned to each item. All items were modelled to operate at full power when in use and to run simultaneously, to ascertain a worst-case scenario.

The construction period from 2 July until 13 July was taken to be the worst-case construction phase with the following operations and equipment use, shown in Table 4.2.

Table 4.2 Worst-Case Construction Equipment

Construction Activity	Equipment Required
Site establishment	2 Trucks
	1 Crane, mobile
Temporary access road construction	2 Trucks
	1 Grader
	1 Roller
Perimeter fence construction	1 Bobcat
Clear and grub	1 Chainsaw
	1 Mulcher
	1 Scraper
	1 Dozer
	1 Excavator

The location of each piece of machinery around the site was estimated to represent a realistic worst-case situation, with many items positioned at locations on the site closest to the sensitive receivers.

4.2.4 Modelled Construction Noise Results

Table 4.3 Modelled Construction Noise Results

Receiver Location	Sound Power Level dB(A)
R1	55
R2	48
R3	49
R4	50
R5	50

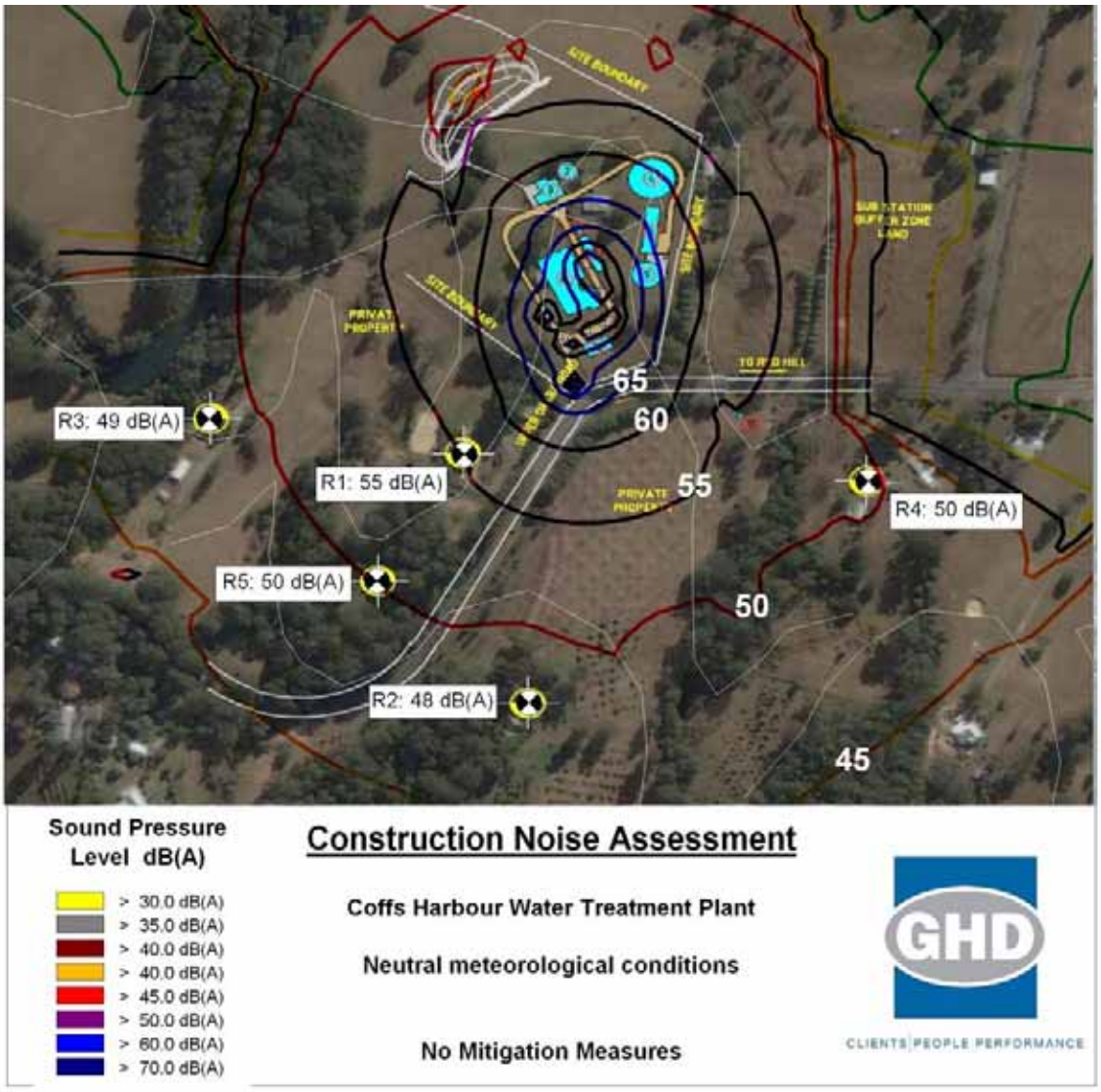

Figure 4 Construction Noise Contours

In a worst-case configuration with all machines operating at their maximum power, the adopted noise criteria of 35 dB(A) has the potential to be exceeded at the nearest receivers. However, it is highly unlikely that all of the machinery would be operating at full power at the same time for an extended period.

The construction noise criteria are set for noise levels determined as $L_{A10(15min)}$. During a full 15-minute period, the machinery items to be used on site will operate at maximum sound power levels for only brief stages. At other times the machinery may produce lower sound levels while carrying out activities not requiring full power.

In addition, mobile machinery will likely move about during the 15 minutes, variously altering the directivity of the noise source with respect to individual receivers.

It is therefore considered that the construction noise model is a conservative representation.

4.3 Operational Noise

4.3.1 Noise Sources

The model took into account the sound power levels of the primary noise sources to be used at the facility, which were sourced from information provided internally by GHD Melbourne[1].

It was assumed that all noise sources are to operate continuously at any one time to provide a worst-case scenario.

The location of the noise sources within the site was done with reference to site layout plans at the time of the assessment. The site plan can be seen in Figure 5.

Table 4.4 Modelled Sound Power Levels dB(A)

Frequency (Hz)		31.5	63	125	250	500	1000	2000	4000	8000	A-weighted
Item	No. Modelled										
Centrifuge	1	38.6	51.8	61.9	69.4	74.8	78.0	79.2	79.0	76.9	85
260 kW Pumps	2	38.6	51.8	61.9	69.4	74.8	78.0	79.2	79.0	76.9	85
Filter Unit Gallery	1	33.6	46.8	56.9	64.4	69.8	73.0	74.2	74.0	71.9	80
Compressor Unit	1	91.0	87.0	92.0	91.0	89.0	92.0	97.0	94.0	86.0	102
Blower Unit	1	91.0	87.0	92.0	91.0	89.0	92.0	97.0	94.0	86.0	102
2.2 kW Flocculator Motors	16	23.2	31.3	48.7	56.6	63.0	65.7	64.7	59.7	55.3	70
30 kW Rapid Mix Tank Motors	2	28.0	40.5	56.7	66.7	71.3	73.6	72.7	67.6	61.7	78

[1] Note – GHD Melbourne are undertaking the design work, therefore specific equipment data was sourced from information current at the time of this assessment.

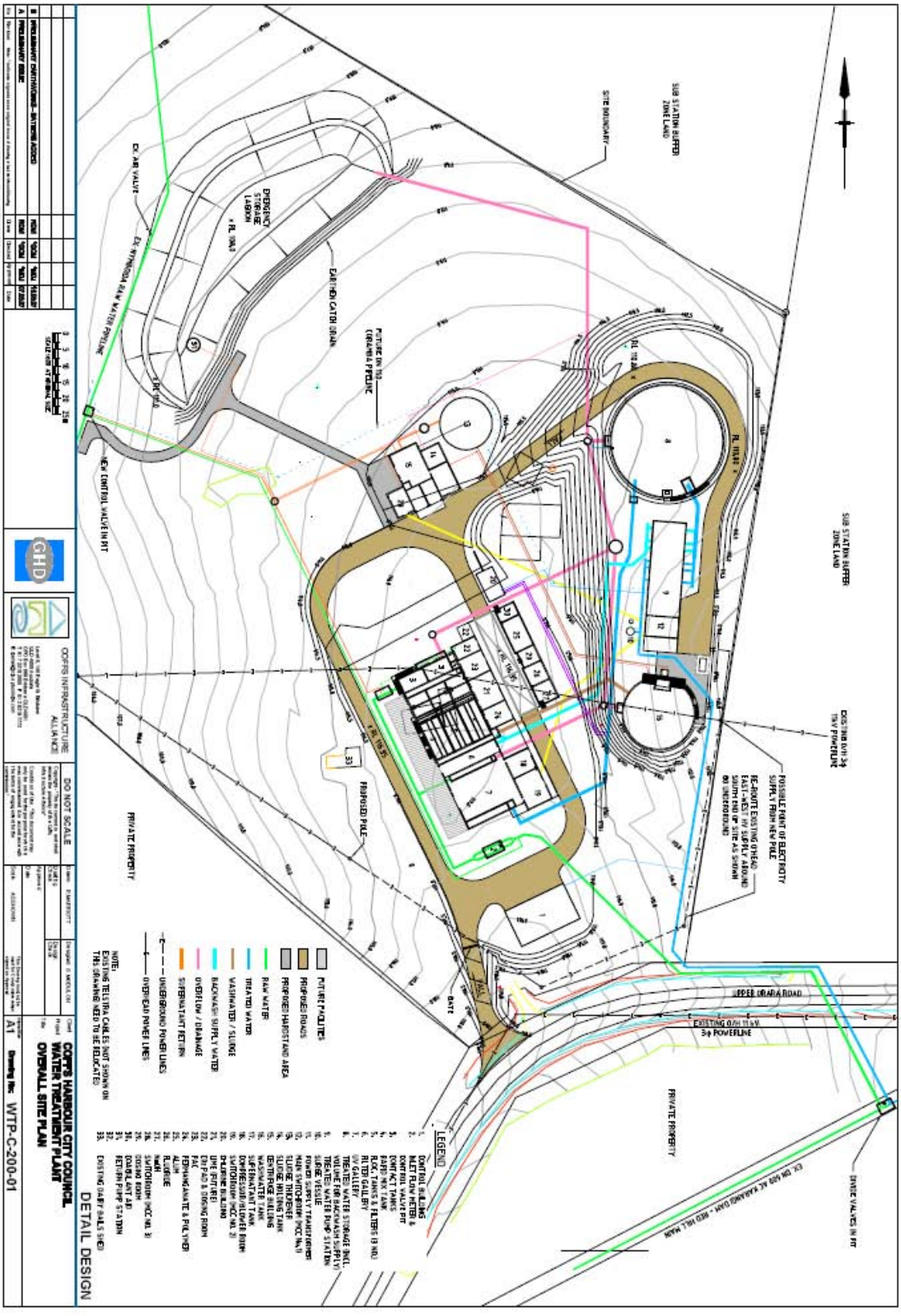

Figure 5 Proposed Site Plan

4.3.2 Modelled Scenarios

Modelling was undertaken based on the following differing meteorological conditions:

- Scenario 1 – calm weather conditions, with no wind during the daytime period;
- Scenario 2 – Class F[2] concawe[3] weather conditions, wind speed 2 m/s towards southwest (residential dwellings) during early morning period;
- Scenario 3 – Class F concawe weather conditions, wind speed 2 m/s towards south east (residential dwellings) during early morning period;
- Scenario 4 - Class F concawe weather conditions, wind speed 2 m/s towards east (residential dwellings) during early morning period;
- Scenario 5 – wind vector modelled with consideration to ISO 9613-2, which takes into account the excess attenuation from downwind propagation. A coefficient of 2 dB, which is likely to be conservative, has been used as the ISO 9613-2 deems values in excess of this exceptional; and
- Scenario 6 - Modelling was also undertaken with no structure (building) enclosing the rapid mix and flocculation tank area of the plant. All other structures and power levels remain unchanged from the previous model. Wind speed 2 m/s in southwest direction.

4.3.3 Modelling Assumptions

Noise modelling is based on the following assumptions:

- Current site drawings show a number of noise sources will be located within buildings or beneath roofed enclosures. Where adequate information was available on building layout, sources, including the flocculators and filter unit were modelled within a steel sheet building (with 45 mm trapezoidal corrugations) with one door opening on the western side of the building (door opening was modelled with normal transmission loss factor of R18);
- Height of equipment sources was modelled based on RL's provided on site diagrams for an accurate representation of sound propagation;
- It is understood the compressors and blowers will be located within an acoustically treated room, however exact information on construction materials and attenuation properties was unknown at the time of the assessment, therefore compressors and blowers were modelled within a concrete hollow (175 mm) block building with one door opening on the eastern side of building (door opening was modelled with normal transmission loss factor of R18);
- At the time of the assessment, the pumps and centrifuge units were proposed to be housed within concrete panelled buildings. As such, the pumps and centrifuge units were modelled within a concrete hollow (175 mm) block building with one door opening on the southern of each building (door opening modelled with normal transmission loss factor of R18);

[2] The default inversion parameter Class F has been used based on the area classified as a non-arid area.

[3] Excess attenuation is calculated according to Concawe standard which takes into consideration Pasquale stability classes, wind speed and wind direction. Concawe standard is based upon a research paper completed in 1981.

- No correction factors were applied for nighttime operating periods; therefore modelling was based on 24-hour operations; and
- The surrounding areas of the site are predominantly soft soil and grassland; therefore the ground effects were modelled with a ground absorption value of 1, as specified in ISO 9613 – 2 for soft soil.

As such, modelling is likely to be considered worst case for the operation of the facility.

4.3.4 Modelled Operational Noise Results – All Drives Within Structures

Results of the noise modelling indicate that operational noise has the potential to not exceed project specific noise levels during day, evening and nighttime periods.

Modelled results are presented in Table 4.5 below.

Modelled contours are shown in Figures 6-10 below.

Table 4.5 Modelled Receiver Results – All Drives within Structures dB(A)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Receiver Location					
R1	24	27	27	24	26
R2	16	20	20	19	17
R3	20	24	22	20	21
R4	21	24	25	25	23
R5	20	24	24	20	22

4.3.5 Modelled Operational Noise Results – No Structure Over Rapid Mix & Flocculator Tanks (Scenario 6)

This scenario was considered to be ‘worst-case’ and was modelled with wind towards the southwest in the direction of the residential receiver considered closest to the proposed facility.

Modelled contours are shown in Figure 11 below.

Results of the noise modelling without a structure over the rapid mix and flocculator tanks indicate that operational noise has the potential to not exceed project specific noise levels during day, evening and night time periods.

Modelled results are shown in Table 4.6 below.

Table 4.6 Modelled Receiver Results – No Structure over Rapid Mix & Flocculator Tanks (scenario 6) dB(A)

Receiver Location	
R1	31
R2	23
R3	27
R4	26
R5	27

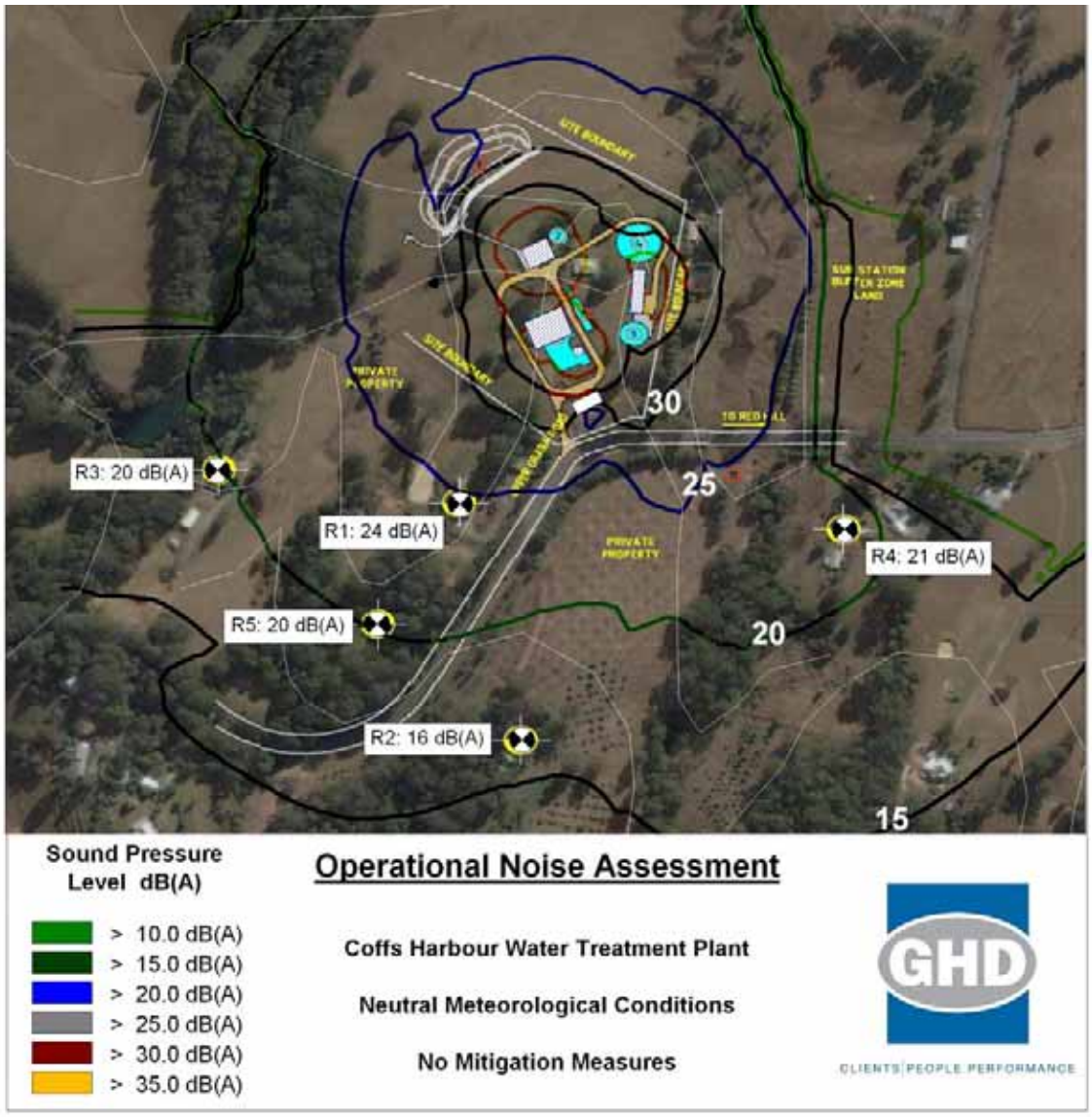

Figure 6 Scenario 1 Noise Contours

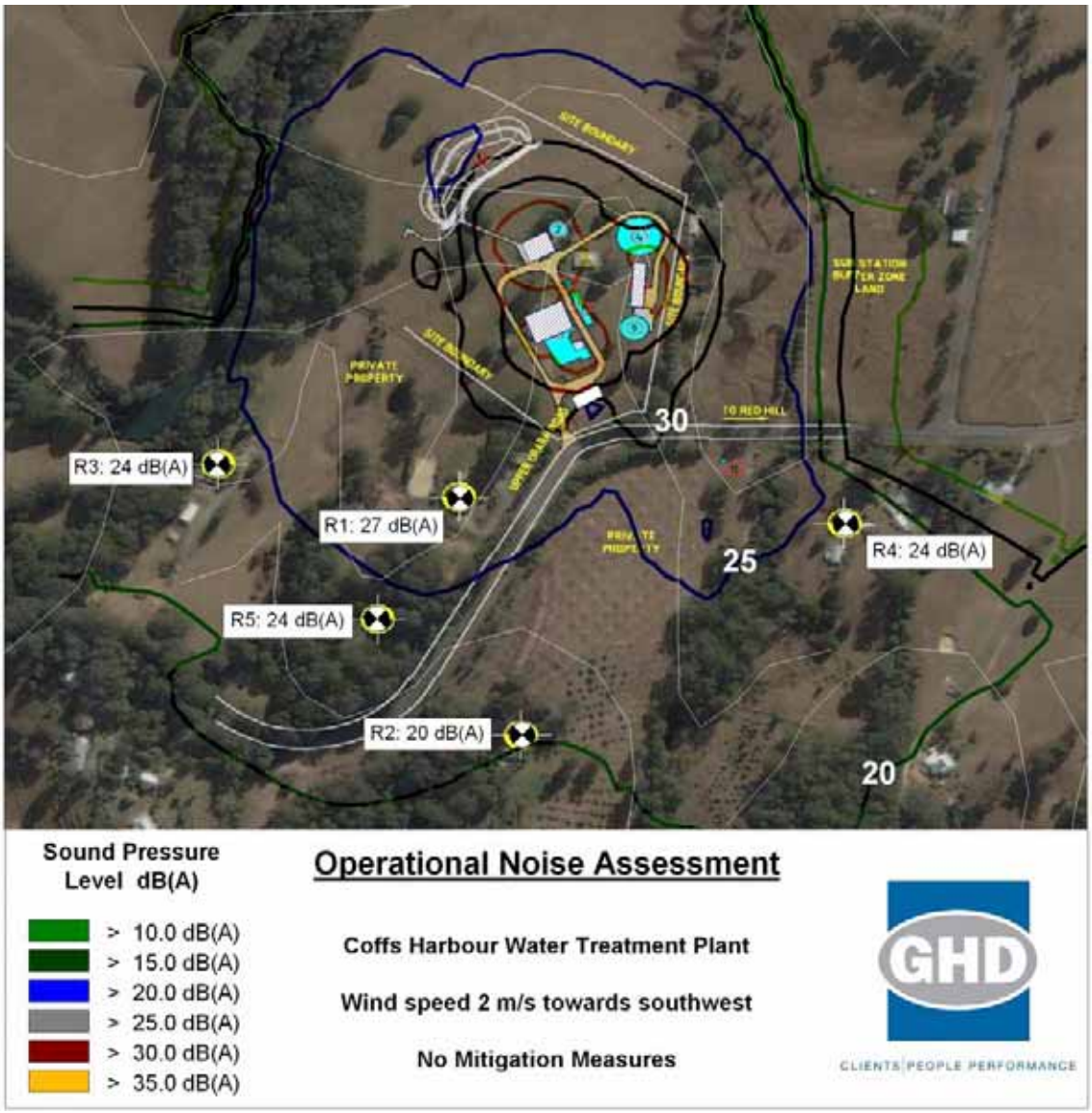

Figure 7 Scenario 2 Noise Contours

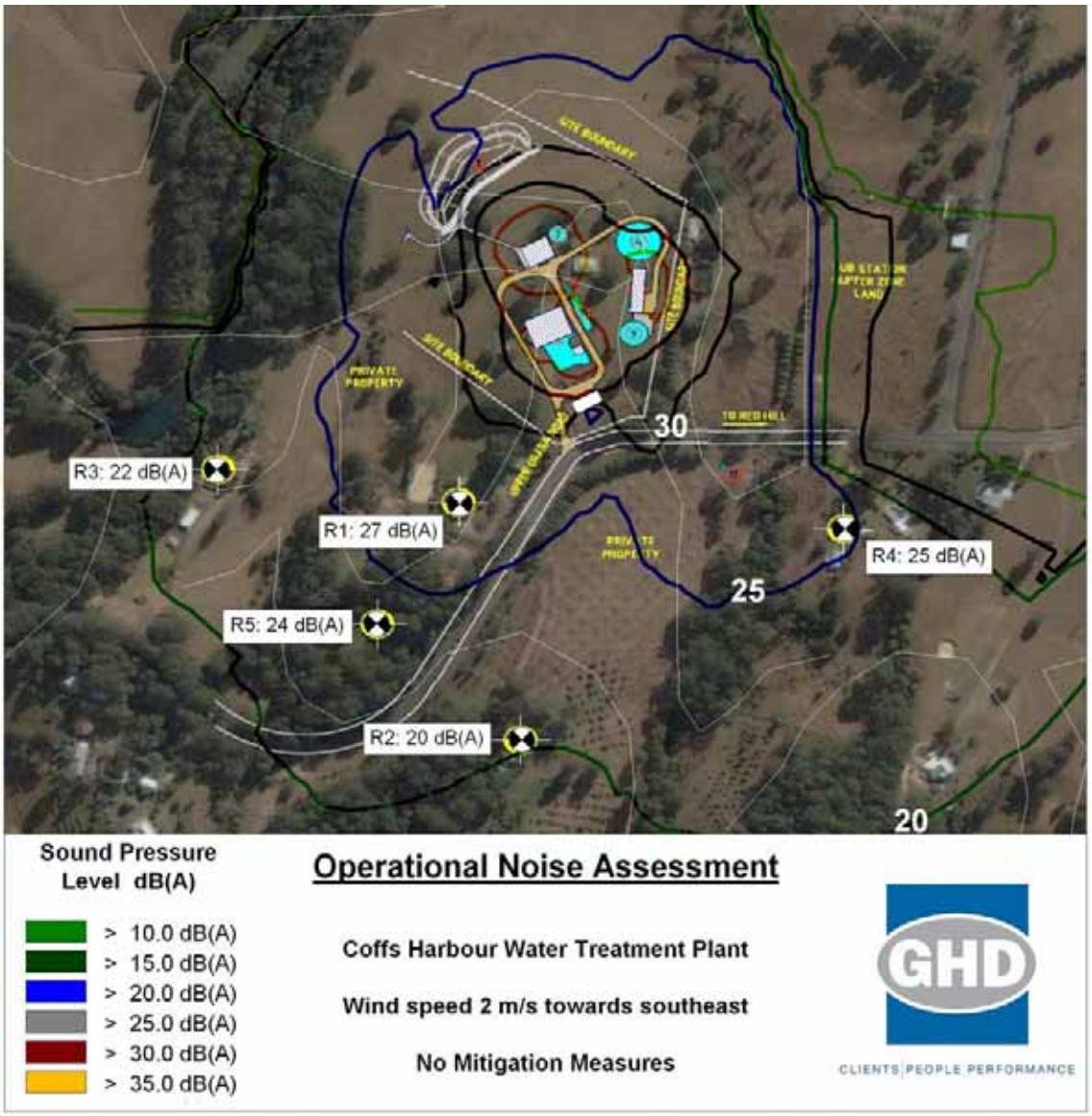

Figure 8 Scenario 3 Noise Contours

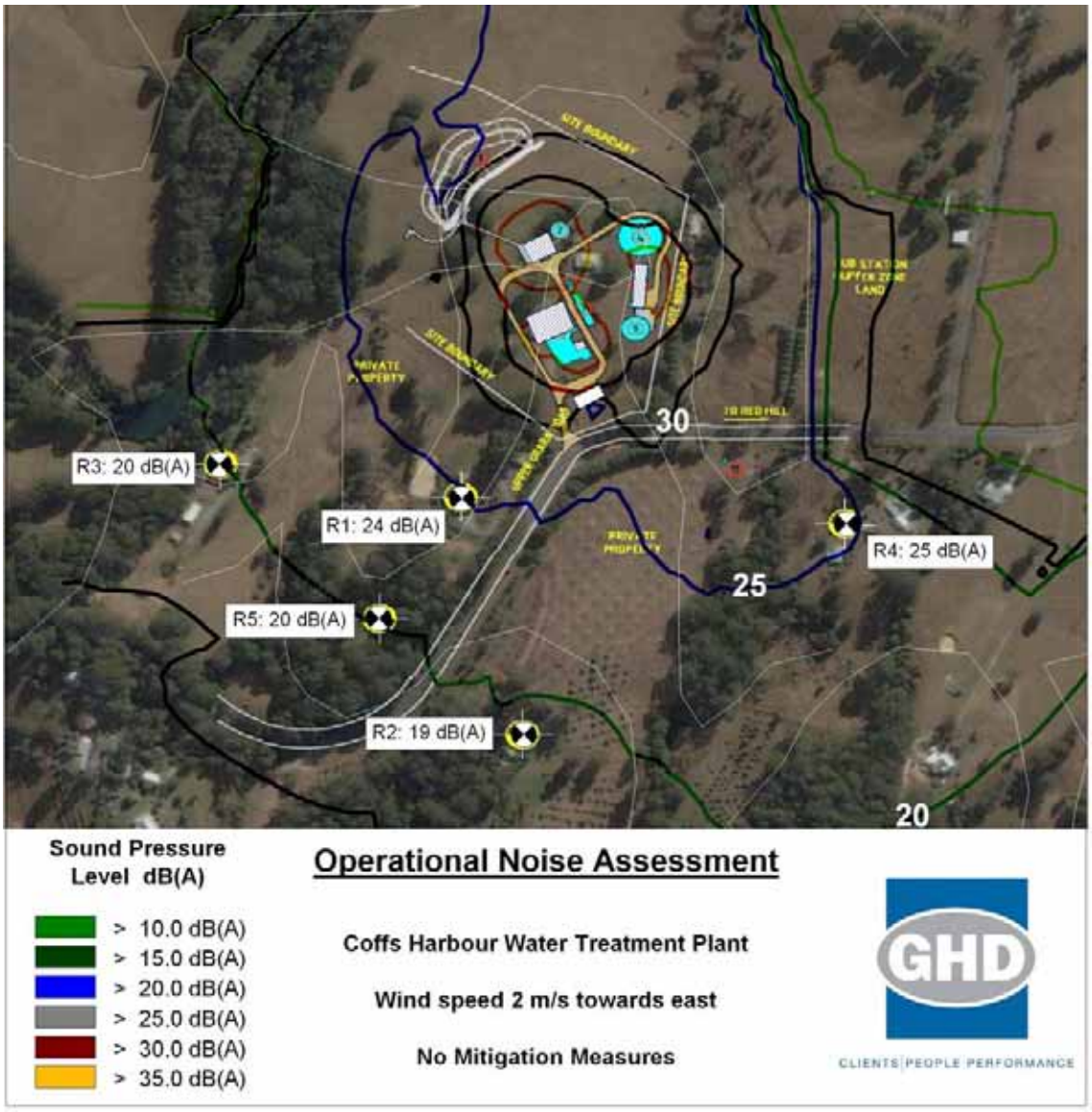

Figure 9 Scenario 4 Noise Contours

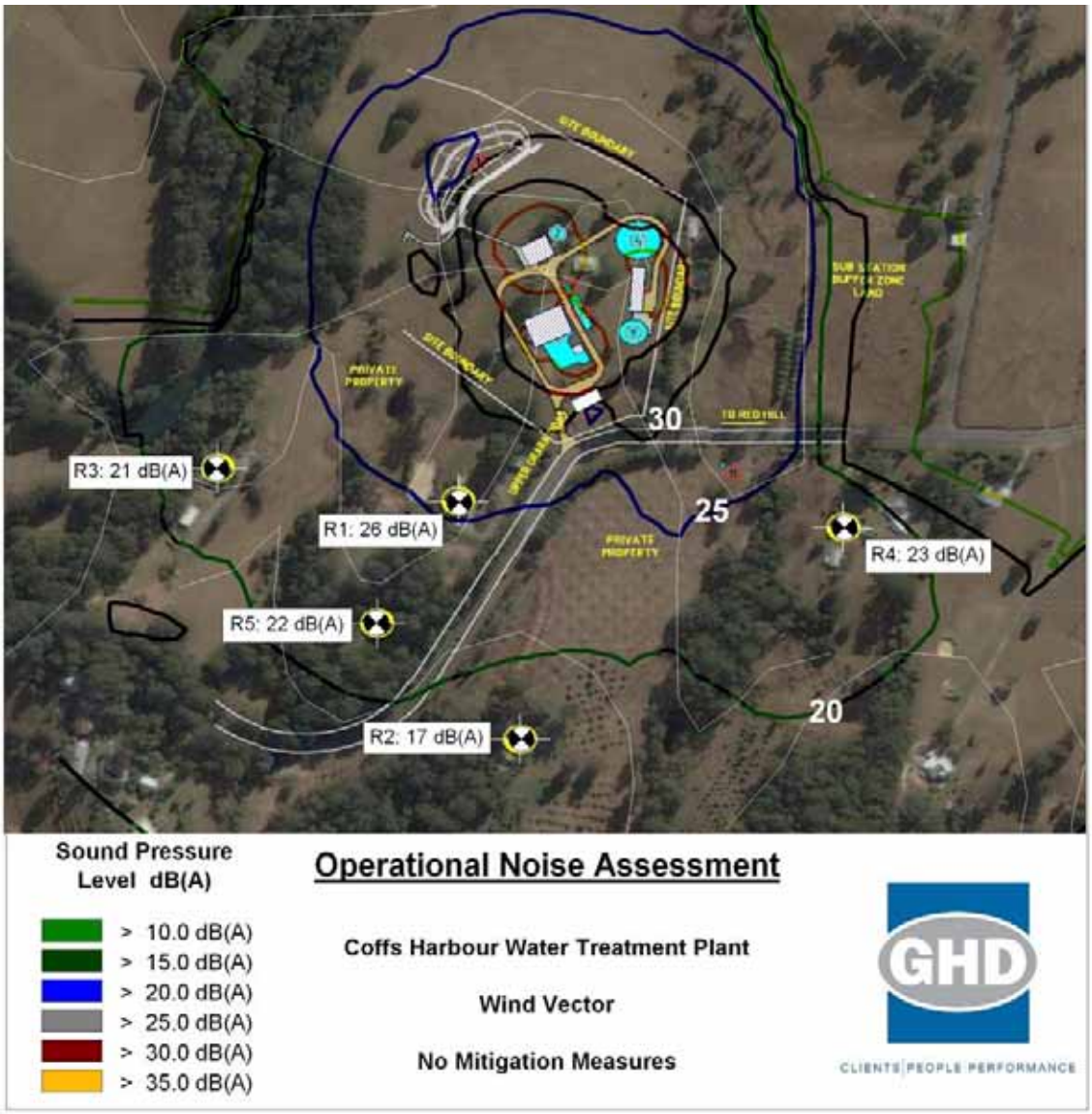

Figure 10 Scenario 5 Noise Contours

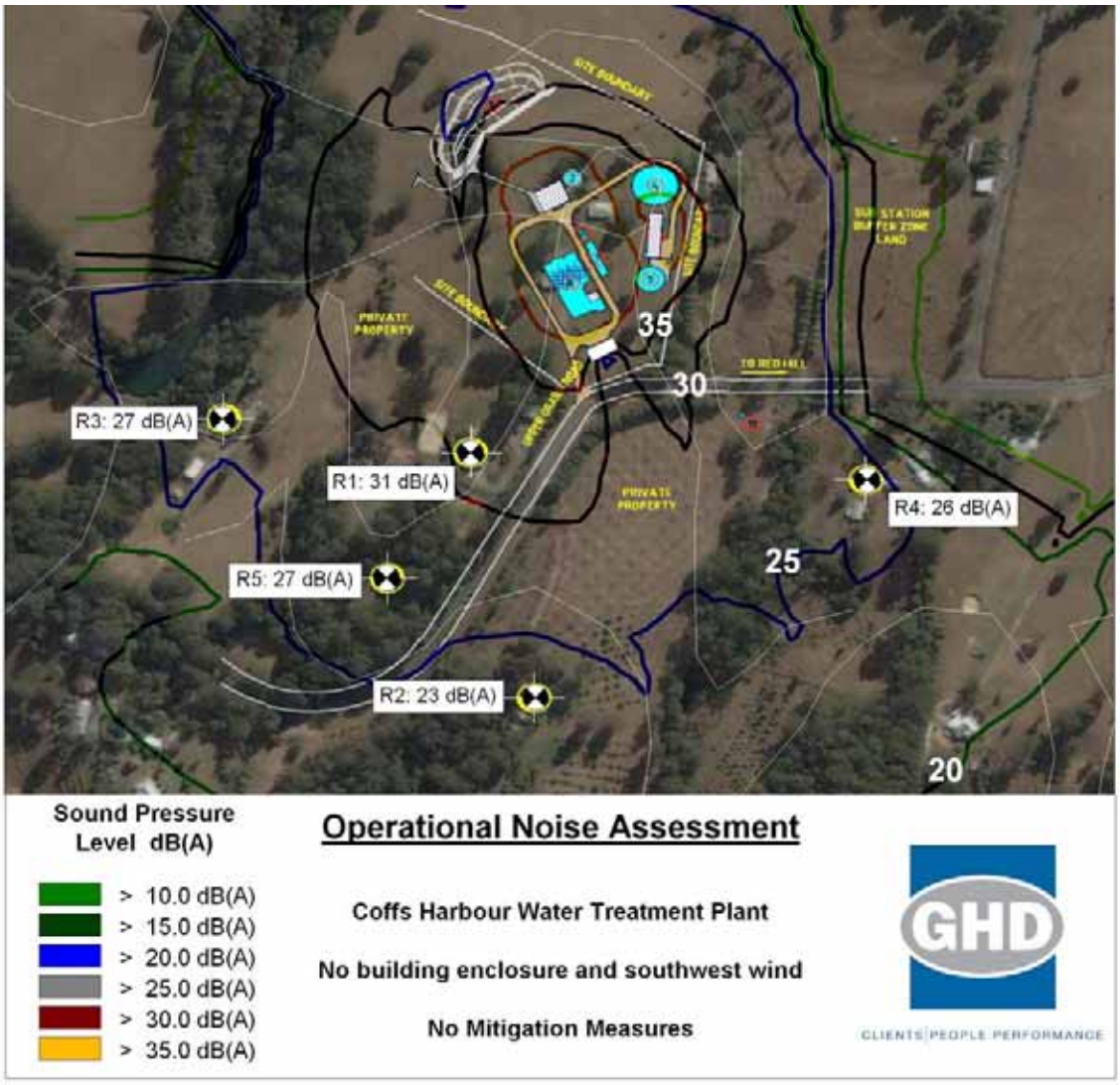

Figure 11 Scenario 6 Noise Contours

5. Recommended Mitigation Measures

5.1 Construction phase

Due to the potential for the construction phase of the proposed development to exceed project specific noise goals the following in-principle mitigation measures have been provided.

5.1.1 Work Ethics / Community Relations

- All work should be kept within the working hours prescribed by the Environmental Noise Control Manual (ENCM). This includes haul trucks not arriving on site before 7:00 am;
- All site workers should be sensitised to the potential for noise impacts onto local residents and encouraged to take all practical and reasonable measures to minimise noise during the course of their activities; and
- The constructor or site developer (as appropriate) should establish contact with the local residents and communicate the construction program and progress on a regular basis, particularly so when noisy generating activities are planned.

5.1.2 Construction Activity

- To minimise noise emissions, construction equipment should be in good condition;
- All combustion engine plant, such as generators, compressors and welders should be checked to ensure they produce minimal noise with particular attention to residential grade exhaust silencers;
- Where practical, machines should be operated at low speed or power and should be switched off when not being used rather than left idling for prolonged periods;
- Machines found to produce excessive noise should be removed from the site or stood down until repairs or modifications can be made;
- Where feasible face engine exhaust and noise emitting components away from nearest residences;
- Impact wrenches should be used sparingly with hand tools or quiet hydraulic torque units preferred;
- Aim to minimise movements of equipment and mobile plant during noise sensitive periods; and
- Site access points and roads should be situated as far as possible away from residential receivers.

Based on the construction noise model it was found that the dominant sources of noise emissions during the construction phase were the grader and the scraper. Therefore, it is recommended that these pieces of machinery be used as sparingly as possible and preferably at locations not in close proximity to residential receivers.

5.2 Operational phase

Based on the results of the assessment it is believed that the proposed WTP should meet project specific noise goals during general daytime and nighttime operations.

6. Conclusions and Recommendations

A noise assessment was undertaken for the proposed WTP to be located near Coffs Harbour, NSW for the purposes of determining whether construction and operation of the facility would have an adverse effect on the acoustic amenity of nearby residences. Modelling was undertaken based on information supplied and available at the time of the assessment, including approximate sound power levels, layout of plant and equipment including relative heights, and numbers of each item or unit.

6.1 Construction Noise

Given the relatively quiet noise climate in the subject area and the proposed duration of construction activities, construction noise has the potential to exceed the relevant criterion at the nearest residences.

This is not an uncommon feature of construction sites and the depth of the issue is alleviated by the fact that site activities are generally temporary in nature. However, the constructor or site developer (as appropriate) is responsible to take every reasonable and practicable step to ensure the noise impact on local residents is minimised at all times. To that effect construction mitigation measures are outlined in Section 5 for implementation throughout construction works on site.

6.2 Operational Noise

It is understood ‘noisier’ items of equipment such as the compressors and blower units will be located within an acoustically treated room. As specific design details of the acoustic attenuation were unknown at the time of the assessment, modelling of these items of equipment were undertaken based on an assumed attenuation which is likely to be less conservative than the actual attenuation proposed for the room.

Results of the modelling suggest noise emanating from the operational water treatment plant has the potential to not exceed project specific noise levels during day, evening and nighttime operation.

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