E-WASTE RECOVERY FACILITY

55 Long Street, Smithfield

Noise Impact Assessment

Jackson Environmental and Planning

Date
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Report
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Document Approval	
Approver Signature	
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Title	Environmental Manager

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APPENDICES

1. INTRODUCTION

Jackson Environment and Planning has commissioned Trinity Consultants Australia (formally ASK and ANE) to undertake a noise assessment for a warehouse being repurposed by Mint Biomining to recycle E-waste at 55 Long Street, Smithfield. The site proposes to operate 24 hour a day, 7 days a week.

The purpose of this report is as follows:

- Review the proposed operations with respect to noise and vibration.
- Outline the relevant project noise criteria.
- Present the results of noise monitoring.
- Predict and assess the noise emissions from the development.
- Describe noise mitigation or management requirements, if any.

To aid in the understanding of the terms in this report a glossary is included in **Appendix A**.

2. STUDY AREA DESCRIPTION

The proposed development is to be located at 55 Long Street, Smithfield. The site location is shown in **Figure 2.1** (source: NSW Spatial Map Viewer).

The site is situated in an established industrial area.

The proposed development is surrounded by the following uses (refer **Figure 2.1**):

- Industrial uses to the east, north, west and south beyond Prospect Creek.
- Long Street Park and Prospect Creek to the south across Long Street.
- Single storey residential dwellings, more than 500 metres to the south-west of the subject site.

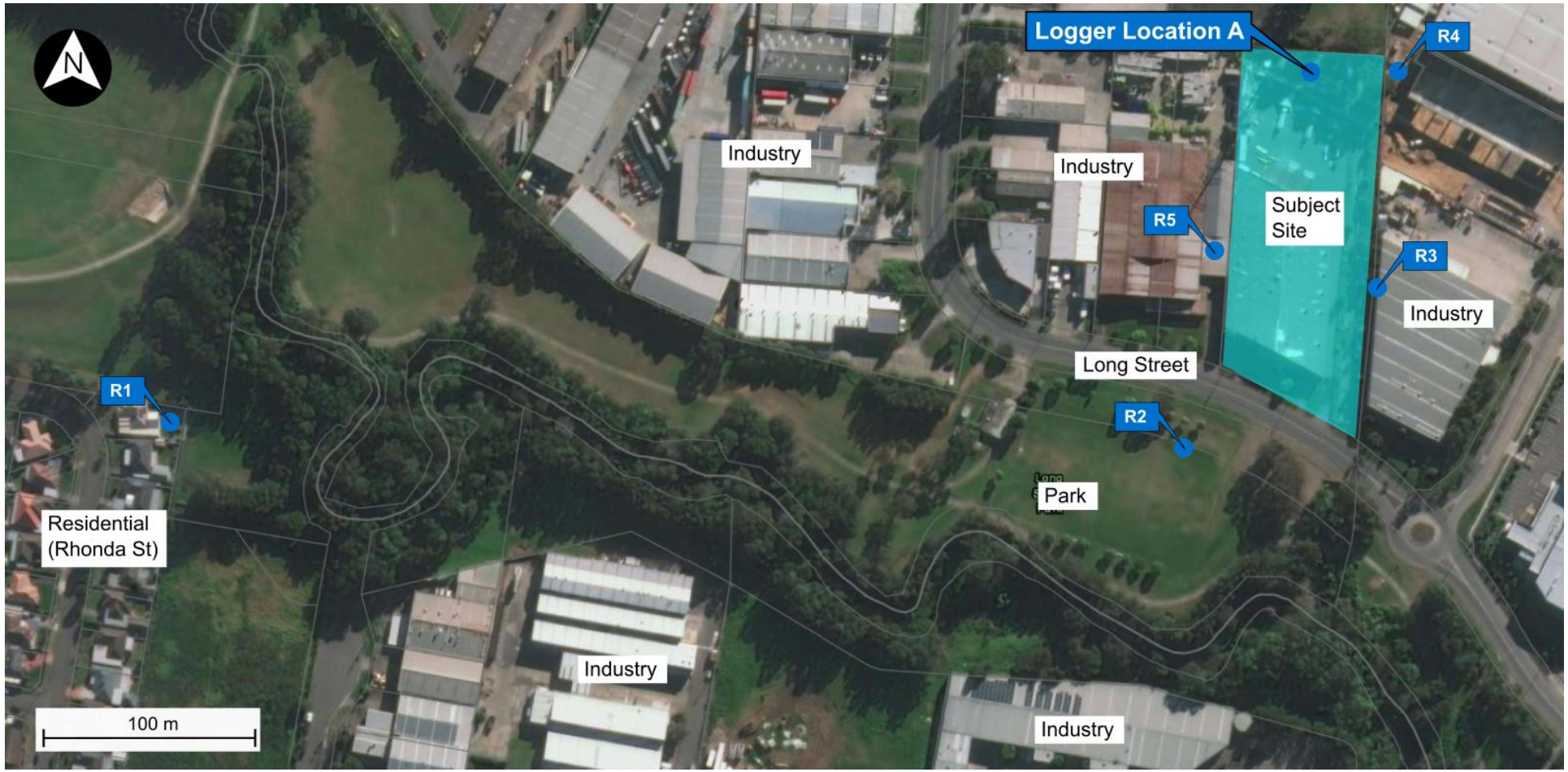


Figure 2.1 Site Location

3. PROPOSED DEVELOPMENT

3.1 Operations

Mint Bioming propose to develop a full-scale E-Waste recycling facility to process printed circuit boards (PCB's) within an existing warehouse at 55 Long Street, Smithfield (Lot 173 / DP 548880).

The proposed building plans are included in **Appendix B**.

The proposed hours of operation are as follows:

- 24 hours a day 7 days a week
- Closed public holidays

Anticipated site traffic movements include the following:

- Two 15 tonne trucks per day and a single B-double per day, 5 days a week, during daylight hours (7am to 6pm)
- Staff parking, 25 car spaces at the rear of the subject site (all hours)

On a typical operating day, site noise is characterised by fixed processing plant inside the main warehouse, with only occasional truck movement across the site. The defining noise sources are considered continuous in nature.

The proposed development has the potential to create noise impacts on nearby residences (R1), local park (R2) and industrial (R3 to R5) due to mechanical plant and onsite vehicles. These potential impacts are required to be considered in the project design. If predicted noise emission levels are compliant at these receivers, then it is considered that all noise emission levels are compliant at all other receptors in the surrounding area.

While the site is proposed to operate during the night period (10 pm to 7 am), it is noted that instantaneous noise sources (e.g. dropping of materials, hammering) normally associated with sleep disturbance are not expected to define operations. This is expected to minimise the potential for sleep disturbance for out of hour operations.

Vibration impacts from the site are expected to be limit. Site equipment consists of multiple small fixed processing plant (e.g. pumps, electric motors). Even when combined, these equipment items are expected to produce a small vibration footprint.

3.2 Construction

As the warehouse is an existing structure, construction works will primarily involve internal refurbishment of the existing building (including new amenities, reduction in mezzanine level and new stairs) and upgrades to building facades, in addition to installation of a concrete bund. This will be followed by the installation of the relevant equipment (e.g. storage tanks, mechanical equipment). Standard construction methods and tools, typically of even residential house construction, are expected to be used on site. Due to the limited nature of the expected works and the separation distances to the nearest residential receivers, noise and vibration impacts during construction is not expected to be an issue.

4. PROJECT CRITERIA

4.1 Noise Policy for Industry

4.1.1 Overview

The acoustic assessment has been completed in accordance with the procedure identified in the NSW Noise Policy for Industry (2017), published by the NSW Environment Protection Authority. The policy sets two separate noise criteria to meet environmental noise objectives: one to account for intrusive noise and the other to protect the amenity of particular land uses. The derivation of the two sets of criteria in accordance with the NSW NPI are presented below.

4.1.2 Intrusiveness Noise Level

According to the NPI, intrusive noise refers to noise that exceeds background noise levels (as defined by the Rating Background Level or RBL) by more than 5 dB. The project intrusiveness noise levels seeks to protect an area against significant change in noise levels. The intrusiveness criteria applies only to sensitive receptors, such as residential dwellings. **Table 4.1** presents the derived intrusiveness noise level for the project, based on the minimum assumed RBL and project intrusiveness noise as per the NPI (2017), Table 2.1.

Table 4.1: Intrusiveness Noise Level (Noise Policy for Industry Table 2.1)

Period	RBL	Intrusiveness Noise Level $L_{Aeq,15min}$
Southern Residential Area (Location B)		
Day	35	40
Evening	35	40
Night	30	35

4.1.3 Amenity Noise Level

The project amenity noise levels aims to protect an area against cumulative noise impacts from industry and to maintain the acoustic amenity for specific land uses. Unlike the intrusiveness noise level which focuses on residential uses, the amenity noise level applies to all types of land uses (e.g. commercial, industrial and residential). The project amenity noise level is defined as follows:

Project amenity noise levels = recommended amenity noise level for land use of interest minus 5 dBA.

The recommended amenity noise level for a particular land use is presented in Table 2.2 of NPI and is provided below for ease of reference.

Table 4.2 presents the recommended amenity noise levels as defined in the NPI.

Table 4.2: Recommended Amenity Noise Levels (Noise Policy for Industry Table 2.2)

Receiver	Noise Amenity Area	Time of Day	Recommended Amenity Noise Level L_{Aeq}, dBA
Residential	Rural	Day	50
		Evening	45
		Night	40
	Suburban	Day	55
		Evening	45
		Night	40

Receiver	Noise Amenity Area	Time of Day	Recommended Amenity Noise Level L_{Aeq}, dBA
	Urban	Day	60
		Evening	50
		Night	45
Hotels, motels, caretakers' quarters, holiday accommodation, permanent resident caravan parks	See column 4	See column 4	5 dB(A) above the recommended amenity noise level for a residence for the relevant noise amenity area and time of day
School classroom – internal	All	Noisiest 1-hour period when in use	35 (see notes for table)
Hospital ward			
internal	All	Noisiest 1-hour	35
external	All	Noisiest 1-hour	50
Place of worship – internal	All	When in use	40
Area specifically reserved for passive recreation (e.g. national park)	All	When in use	50
Active recreation area (e.g. school playground, golf course)	All	When in use	55
Commercial premises	All	When in use	65
Industrial premises	All	When in use	70
Industrial interface (applicable only to residential noise amenity areas)	All	All	Add 5 dBA to recommended noise amenity area

The receivers relevant to this noise assessment include residential dwellings in an urban noise amenity area (to the east and south of the site). Based on this, the recommended amenity noise levels are 60 dBA, 50 dBA and 45 dBA for the day, evening and night, respectively. The noise limit for industry premises is 70 dBA.

As per the Noise Policy, 5 dB is deducted from the recommended amenity noise levels to get the project amenity noise levels. Also a 3 dB adjustment is used to convert from a period level to a 15-minute level. The project amenity noise levels are shown in **Table 4.3**.

Table 4.3: Amenity Noise Levels

Period	Recommended Amenity Noise Level dBA	Adjustment dBA	Project Amenity Noise Level L_{Aeq}, dBA
Residential – Urban (South-Western, Location A)			
Day	60	-5 + 3	58
Evening	50	-5 + 3	48
Night	45	-5 + 3	43
Industrial Premises			

Period	Recommended Amenity Noise Level dBA	Adjustment dBA	Project Amenity Noise Level L_{Aeq}, dBA
When in use	70	-5 + 3	68
Active recreation area			
When in use	55	-5 + 3	53

4.1.4 Limiting Noise Criteria

As required by the NSW NPI, the lower of the intrusive and amenity noise levels is to be adopted for an assessment. The final levels are referred to as the project noise trigger levels, which are summarised in **Table 4.4**.

Table 4.4: Project Noise Limits

Period	Background Noise Level L_{90}, dBA	Intrusiveness Noise Level L_{eq}, dBA	Amenity Noise Levels L_{eq}, dBA	Proposed Project Noise Level $L_{Aeq,15\text{-}minute}$
Residential (Urban) – Location A				
Day	35	40	58	40
Evening	35	40	48	40
Night	30	35	43	35
Industrial				
When in use	-	-	68	68
Active recreation area				
When in use	-	-	53	53

The noise criteria apply at the most-affected point (i.e. highest noise level) on or within the residential property boundary. If the actual property boundary is more than 30 metres from the house, then the criteria apply at the most-affected point within 30 m of the house.

The NPI requires consideration of sleep disturbance impacts for operations occurring between 10 pm and 7 am. As per the NPI, the greater value between 52 dBA or the prevailing RBL plus 15 dB is considered as sleep disturbance noise limit. As discussed in **Section 3**, due the nature of on-site activities (continuous fixed plant), sleep disturbance impacts from instantaneous noise sources is unlikely. Therefore, consideration of the night-time L_{Aeq} limit is considered sufficient to address night-time noise impacts.

4.2 Road Traffic Noise Criteria

The proposed increased capacity is expected to increase truck movements to the site and along the surrounding road network. Noise criteria applicable to traffic generating developments are specified in the NSW Road Noise Policy 2011 (NSW RNP). The NSW RNP states that 'for existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding 'no build option'. The relevant noise parameter for assessing changes to noise levels is the $L_{Aeq,15\text{-}hour}$ (7 am to 10 pm) for day time and $L_{Aeq,9\text{-}hour}$ (10 pm to 7 am) for night time.

Based on the given traffic data, being a maximum of 3 heavy vehicles per 24-hour period or maximum of 1 per hour, the subject site is unlikely to affect road traffic noise levels in the surrounding area. It is expected that compliance with the 2 dB allowable increase would be achieved by a large margin.

5. NOISE MEASUREMENTS

5.1 Overview

Acoustic measurements consisted of an attended noise measurements and noise logging at Location A, Located at the rear of the subject site. Noise logging was attempted at the park across the road however no secure location could be ascertained. The noise measurement location is shown in **Figure 2.1** and are described as follows:

The noise monitoring was undertaken in general accordance with Australian Standard AS1055 Acoustics – Description and measurement of environmental noise and the NSW Noise Policy for Industry (2017), as described in the following sections.

5.2 Attended Noise Measurement

Attended noise measurements were undertaken at Location A. The measurement was undertaken on Wednesday 14/07/2021 and 21/07/2021 using a field and laboratory calibrated Norsonic NOR140 sound level meter. The microphone height was approximately 1.3m above natural ground level and was located in the free field.

Weather during the time of monitoring was fine, sunny, 15^{o}C with moderate wind.

The measured noise levels are summarised in **Table 5.1**.

Table 5.1: Attended Noise Measurement Results

Location	Date, Time and Duration	Results and Notes
A	14/7/2021 15 minutes	Statistical noise levels: L_{eq} 53 dBA, L_{Max} 74.3 dBA, L_{90} 49 dB
A	21/7/2021 15 minutes	Statistical noise levels: L_{eq} 59 dBA, L_{Max} 94.3 dBA, L_{90} 48.6 dB

Note: * The reported noise levels, excluding the statistical noise levels, are the instantaneous levels read from the sound level meter, and generally represent the range in noise levels or maximum noise levels for a particular noise source.

Trees were overhead and the surface surrounding the monitoring location was mainly concrete and bitumen. Local noise sources were wind in trees, industrial noise from neighbours and road traffic from Long Street. Road traffic at the monitoring location is attenuated by buildings between the road and the site. Weather was cloudy with intermittent light showers and temp of 14 degrees with light w winds.

Industrial noise dominated on 14/7 and wind in trees dominated on 21/7 due to higher winds. Local maximum noise events were due mainly to local truck movements on adjacent properties. Observations indicate background noise in the area is constant in spite of variations in ambient due to local events. There was no noise contribution from the subject property, which was unoccupied. High tension wires were partially overhead and could possibly produce low volume tonal noise in humid weather.

5.3 Noise Logging

Noise logging was undertaken at Location A. Logging was undertaken from Wednesday 14/7/2021 to Wednesday 21/7/2021 in the free-field using a field and laboratory calibrated ARL Ngara Type 2 environmental noise logger.

Data from the Bureau of Meteorology (Prospect Reservoir #67019) indicates that weather during the monitoring period was generally fine but with light rainfall on 17th (1mm). Overall, the noise monitoring data is considered acceptable for use in this report.

The measured noise levels are shown in **Figure 5.1** and the 24 hours L_{A90} noise levels are shown in **Figure 5.2**.

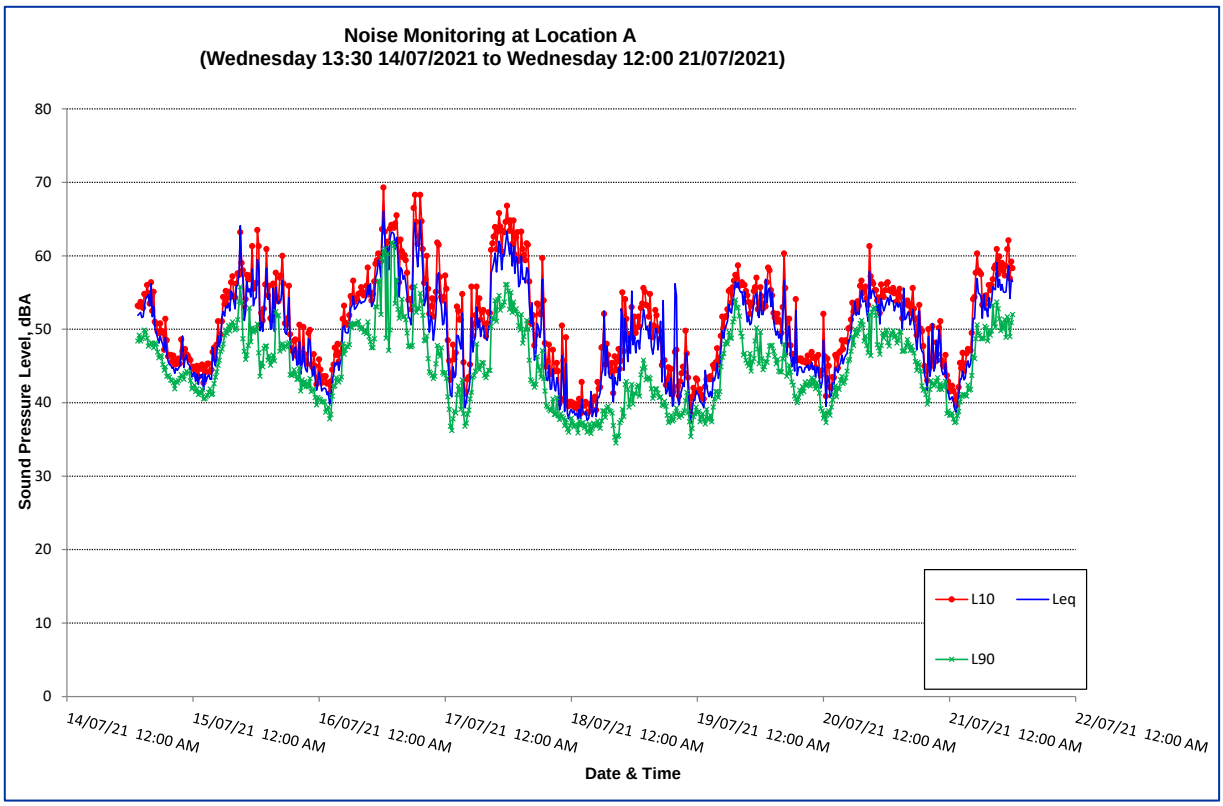


Figure 5.1 Graph of Noise Logging Results at Location A

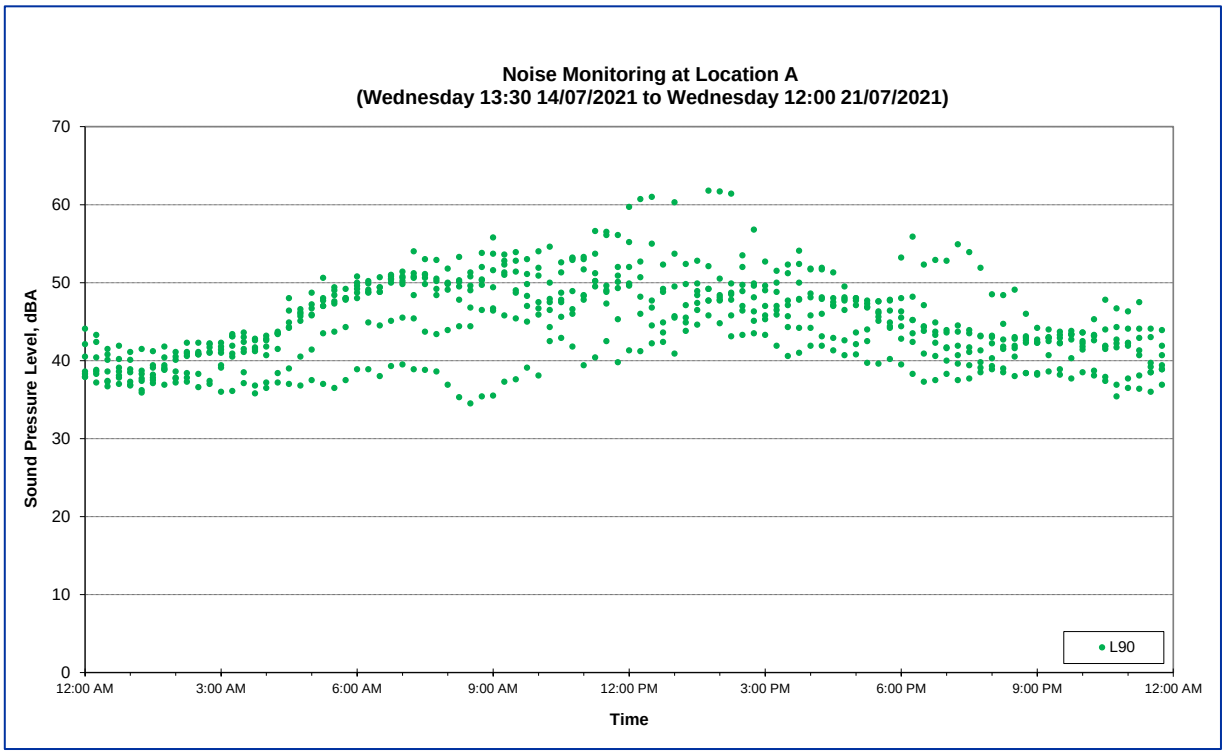


Figure 5.2 Graph of 24hour L_{A90} Noise Logging Results at Location A

The background noise levels were relatively free of insect noise and were calculated using the lowest 10th percentile method. The background noise levels are shown in **Table 5.4**.

Table 5.2: Background Noise Levels at Location A

Period	Rating Background Noise Level (RBL) L_{90} dBA
Day (7am to 6pm)	45
Evening (6pm to 10pm)	41
Night (10pm to 7am)	38

At noted earlier, noise logging was attempted at the park across the road, closer towards the nearest houses, however no secure location could be ascertained. For the purpose deriving the project intrusiveness noise as per the NPI (2017), Table 2.1 as shown in **Table 4.1**., the minimum RBL values adopted by the NPI have been used. This is likely to represent a conservative assessment to assessing noise impacts from the site.

5.4 Summary

From the results above the following summary comments are made:

- The background noise levels at Location A were dominated by local industrial sources.
- The background at Location R1 will be assessed against the minimum assumed RBL and project intrusiveness noise criteria outlined in the NPI (2017), Table 2.1.

6. NOISE MODELLING

6.1 Modelling Methodology

For the purposes of predicting impacts associated with noise emissions from site on nearby sensitive receptors, noise modelling of the sources was completed using the proprietary software SoundPlan v8.2. SoundPlan incorporates the influence of meteorology, terrain, ground type and air absorption in addition to source characteristics to predict noise impacts at receptor locations. The prediction method incorporated into SoundPlan in accordance with ISO Standard 9613-2 (1996) Acoustics – Attenuation of sound during propagation outdoors.

6.2 Meteorology

All predictions have been undertaken in accordance with ISO Standard 9613-2 (1996) Acoustics – Attenuation of sound during propagation outdoors. ISO 9613-2 predictions are relevant for light to moderate downwind conditions (1 to 5 m/s) or a well-developed moderate ground-based temperature inversion (e.g. clear, calm night).

6.3 Topography

5 metre LiDAR data for the area surrounding the development was obtained from the Geoscience Australia Elevation Information System. Intervening industrial buildings around the site have been included in the model.

6.4 Sensitive Receptors

Discrete receptors have been modelled at residential receptors to the east. **Figure 2.1** presents the modelled discrete receptors.

For houses to the south, noise levels have been predicted at 1 m from the facades of each house. Given the small size of the lots and proximity of houses to lot boundaries, predicted façade noise levels are expected to be similar to levels at the nearby boundaries.

Noise predictions have been completed at ground floor (1.5 m above ground).

6.5 Noise Source Data

Table 6.1 presents the modelled noise source data for key operational noise sources. Noise data has been obtained from Jackson Environmental and Trinity database.

The majority of noise sources are located within the warehouse and are inclusive of a forklift and up to 60 pieces of mechanical plant ranging from pumps to filter presses to conveyor motors to agitators. The sound data provided by Jackson Environmental shows that sound power levels of equipment ranges from 50 dBA to 88 dBA. All of the mechanical plant sources were contained within the warehouse and were summed together to provide a total sound power level of 98.3 dBA. The internals of the warehouse has been modelled as a reverberant field with a reverberation time, T_{60}, of 10.57 sec, which resulted in a room average noise level of 83.9 dBA. The materials of construction have been assumed as:

- Polished concrete flooring
- Walls – hollow core blockwork 1800kg/m^3
- Roof – corrugated sheet metal
- Roller doors – modelled as open with no attenuation.

Noise source locations are shown in **Figure 6.1**.

Figure 6.1: Noise Source Locations

Table 6.1: Noise Source Data

Noise Source	Sound Power Level, dBA								Total		
	63	125	250	500	1k	2k	4k	8k	L_w	$L_{w,eq}$	Room Average
Mechanical Plant x 60	68	78	82	88	92	93	94	84	98.3	98.3	84.5
Forklift	63	68	74	80	82	82	78	69	62.9	84.2	
Semi-Trailer or B-Double Movement	77	85	90	95	99	98	91	78	102.9	62.7	N/A
Car Park Movements	57	67	78	78	78	78	72	67	84.0	55.2	N/A

Noise Source	Sound Power Level, dBA								Total		
	63	125	250	500	1k	2k	4k	8k	L_w	$L_{w,eq}$	Room Average
Car Park Door Slam/Engine Start	65	75	86	86	86	86	80	75	92.5	57.9	N/A

6.6 Results

The predicted L_{Aeq} noise levels for operation of the E-Waste facility are shown in **Table 6.2**.

Table 6.2: Predicted Noise Levels at the Residential Receivers

Receiver	Receiver Group	Limit	Highest Predicted L_{Aeq} Noise Levels, dBA
R1	South-western residences	40/40/35 (D/E/N)	21
R2	Active Use Recreation	53	41
R3	Industrial	68	38
R4	Industrial	68	46
R5	Industrial	68	39

The results of the modelling indicate the predicted noise levels are within the relevant noise criteria for all nearby receptors, including the south-western residential area, park across the road from the site and industrial uses nearby. It is noted that noise levels are relatively low due to all fixed plant being located inside the main building.

7. NOISE MANAGEMENT

Noise modelling results indicate that the predicted noise levels are well below the project noise limit criteria. Nevertheless, given the night-time operations, it is important that good noise management practices are adopted. The following list of measures is provided for assistance to manage noise emissions from the development, where practical:

- It is recommended that the southern roller door (closest to the nearest residences) remain closed during night-time operations.
- Utilising broadband reversing alarms on mobile equipment (instead of tonal beepers).
- Keeping equipment well-maintained and operating it in a proper and efficient manner.
- Ensuring staff are made aware of noise-sensitive neighbours and adopting noise management practices.

At this stage mechanical design is not complete, and therefore it is recommended that the chiller located at the front of the site (between Long Street and the warehouse) be designed and selected to achieve the relevant noise limits.

8. RECOMMENDATIONS AND CONCLUSION

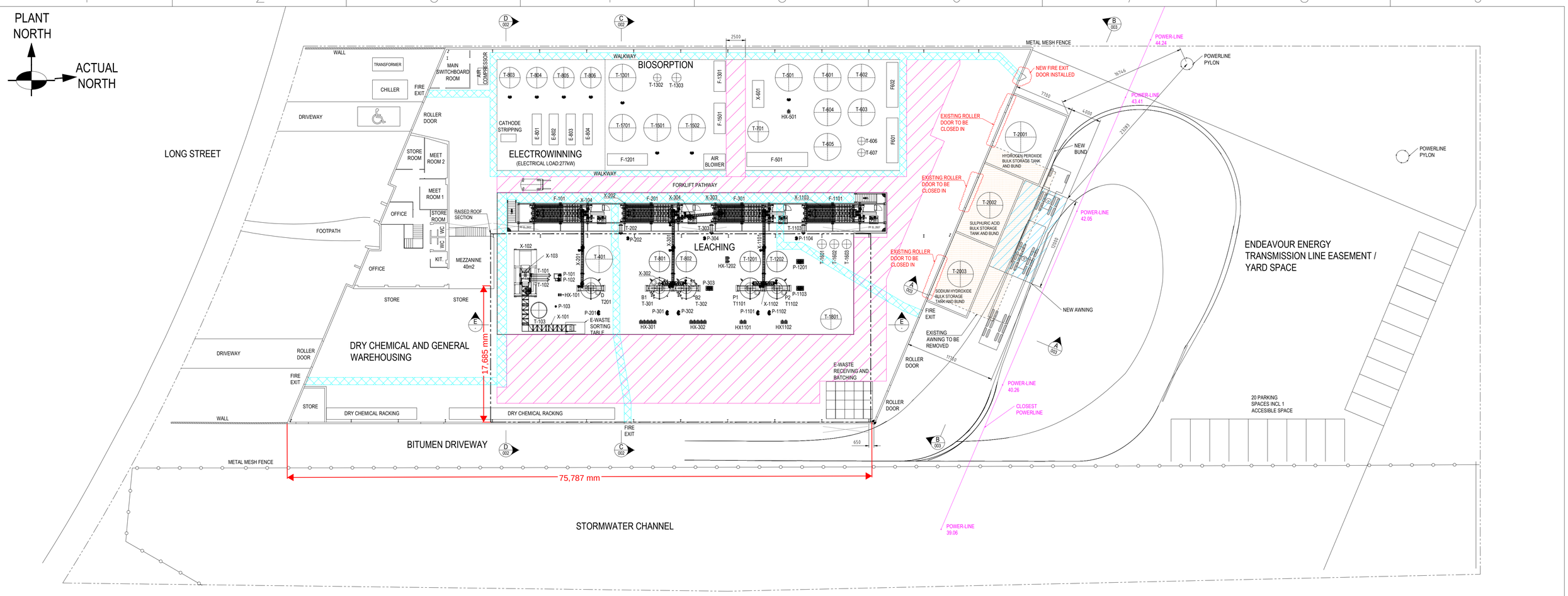
The following conclusions can be drawn from the noise assessment for the proposed E-Waste recycling facility at 55 Long Street, Smithfield:

- The nearest residential receptors to the site are located to the south-west at a separation of approximately 500 metres. Industries receptors are located along the eastern, western and northern boundaries of the site. A public park exists across the road, directly south of the site.
- The key noise sources for the site are continuous in nature and associated with fixed plant operating inside the main processing building. Proposed operational hours are summarised as follows:
  - Operation of machinery: 24 hours a day, 7 days a week.
  - Deliveries, twice a day, maximum of one an hour.
  - Closed public holidays.
- The results of the modelling are discussed in **Section 6.6** and indicate predicted compliance with day, evening and night criteria at all nearest receptors.
- Instantaneous noise sources associated with L_{AMax} sleep disturbance noise impacts are not expected during the night (due to the primarily continuous nature of noise sources at the site). Nonetheless, given the night-time operations, it is important that good noise management practices are adopted, as discussed in **Section 7**.
- Based on the expected traffic for the development (3 additional per day), the increase in traffic noise is expected to be negligible (see **Section 4.2**).
- At this stage of the project, mechanical design is not complete and therefore it is recommended that the chiller located at the front of the site (between Long Street and the warehouse) be designed to adopted noise criteria.
- Due to the limited nature of the expected construction works to refurbish the existing building and the separation distances to the nearest houses, construction noise and vibration is not expected to be an issue (as per **Section 3.2**).

APPENDIX A: GLOSSARY

Parameter or Term	Description
dB	The decibel (dB) is the unit measure of sound. Most noises occur in a range of 20 dB (quiet rural area at night) to 120 dB (nightclub dance floor or concert).
dBA	Noise levels are most commonly expressed in terms of the 'A' weighted decibel scale, dBA. This scale closely approximates the response of the human ear, thus providing a measure of the subjective loudness of noise and enabling the intensity of noises with different frequency characteristics (e.g. pitch and tone) to be compared.
Day	The period between 7am and 6pm.
Evening	The period between 6pm and 10pm.
Night	The period between 10pm and 7am.
Free-field	The description of a noise receiver or source location which is away from any significantly reflective objects (e.g. buildings, walls).
L_1	The noise level exceeded for 1% of the measurement period.
L_{10}	The noise level exceeded for 10% of the measurement period. It is sometimes referred to as the average maximum noise level.
L_{90}	The noise level exceeded for 90% of the measurement period. This is commonly referred to as the background noise level.
L_{eq}	The equivalent continuous sound level, which is the constant sound level over a given time period, which is equivalent in total sound energy to the time-varying sound level, measured over the same time period.
$L_{eq,1hour}$	As for Leq except the measurement intervals are defined as 1 hour duration.
L_{max}	Maximum A-weighted sound pressure level. Lmax assessment are typically applied to sources such as - (a) impact noises; (b) hammering; (c) loading/unloading; (d) dropping items; (e) beepers, alarms, bells, phones, sirens; (f) power tools; (g) valve releases; (h) air brakes; and (i) door slamming.
L_{eq}(24 hour)	The average Leq noise level over the 24-hour period from midnight to midnight.
L_{10}(18 hour)	The arithmetic average of the one-hour L10 values between 6am and midnight. This parameter is used in the assessment of road traffic noise.

APPENDIX B : DRAWINGS



PLOT PLAN
1:250

LEGEND:

- FORKLIFT PATHWAY
- OPERATOR WALKWAY
- EXISTING AWNING TO BE REMOVED
- NEW EXTENDED AWNING

SITE ADDRESS:
LOT 173 DP548880
NO.55, LONG STREET, SMITHFIELD,
NSW, AUSTRALIA

NOTES:
1. ALL DIMENSIONS ARE GIVEN IN MILLIMETERS.
2. REFER TO DIMENSIONS, SURVEY ELEVATIONS OF SITE BOUNDARIES AND EXISTING BUILDINGS ON ORIGINAL PLANS.
3. REFER TO C&A SURVEYORS DWG NO.18204-21 DET FOR PARTIAL DETAIL SURVEY OF BUILDING AND LOCATION OF NEAREST HIGH VOLTAGE POWER LINE.
4. ALL PROCESS VESSELS AND BULK STORAGE TANKS TO HAVE SECONDARY CONTAINMENT BUND TO APPROPRIATE STANDARDS.
5. TANKER UNLOADING TO HAVE SECONDARY CONTAINMENT BUND.
6. OUTDOOR BULK STORAGE TANKS AND BUND SEPARATION TO CONSIDER AS 3780 AND AS 4326 REQUIREMENTS.
7. DRY CHEMICAL STORAGE TO CONSIDER SEPARATION DISTANCES FOR INCOMPATIBLE MATERIALS.

Tag No	Description	Motor Rating, kW	Noise, dBA
P-102	Undersized Ewaste Filter Press Feed Pump (DN50)	(pneumatic)	75
P-1101	Precious Metal Reactor 1 Recirculating Pump (DN50)	(pneumatic)	75
P-1102	Precious Metal Reactor 2 Recirculating Pump (DN50)	(pneumatic)	75
P-1103	Precious Metal Filter Press Feed Pump (DN80)	(pneumatic)	75
P-1201	Pre-biosorption Recirculation Pump (DN50)	(pneumatic)	75
P-1202	Pre-biosorption Filter Press Feed Pump (DN80)	(pneumatic)	75
P-1301	Biosorption Pump (DN80)	(pneumatic)	75
P-1501	NaOH Neutralization Feed Pump (DN80)	(pneumatic)	75
P-201	Displacement Filter Press Feed Pump (DN80)	(pneumatic)	75
P-301	Piranha Reactor 1 Recirculating Pump (DN50)	(pneumatic)	75
P-302	Piranha Reactor 2 Recirculating Pump (DN50)	(pneumatic)	75
P-303	Piranha Filter Press Feed Pump (DN80)	(pneumatic)	75
P-401	Displacement Recycle Solution Pump (DN80)	(pneumatic)	75
P-501	MgO Neutralization Pump (DN80)	(pneumatic)	75
P-502	Displacement Recycle Solution Pump	(pneumatic)	75
P-602	Ca(OH)2 Slurry Feed Pump (DN80)	(pneumatic)	75
P-603	MgSO4 and Ca(OH)2 Recirculating Pump (DN50)	(pneumatic)	75
P-604	Grey Water Feed Pump (DN80)	(pneumatic)	75
P-605	CaSO4 Recirculating Pump 1 (DN50)	(pneumatic)	75
P-606	CaSO4 Recirculating Pump 2 (DN50)	(pneumatic)	75
P-701	Electrowinning Feed Pump (DN50)	(pneumatic)	75
P-702	Electrowinning Discharge Pump (DN50)	(pneumatic)	75
P-802	Piranha Recycle Solution Pump(DN50)	(pneumatic)	75

Tag No	Description	Motor Rating, kW	Noise, dBA
C-1801	Oilless Scroll Compressor	**75**	66
X-1801	Air cooled modular chiller	**411**	74
P-103	Water recirculating pump	**1.5**	65
X-101	Size reduction feed conveyor	**4.4**	65
X-102	Dual Stage E-waste Hammer Mill	**374**	80
F-101	Hammer Mill Filter Press	**15**	65
F-1101	PML Filter Press	**15**	65
F-201	Displacement Filter Press	**15**	65
F-301	Piranha Filter Press	**15**	65
M-1101	Precious Metal Reactor 1 Agitator	**22**	65
M-1102	Precious Metal Reactor 2 Agitator	**22**	65
M-1103	Foam breaker	**3**	65
M-1104	Foam breaker	**3**	65
M-201	Displacement Reactor Agitator	**22**	65
M-301	Piranha Reactor 1 Agitator	**22**	65
M-302	Piranha Reactor 2 Agitator	**22**	65
M-303	Foam breaker	**3**	65
M-304	Foam breaker	**3**	65
X-104	Size reduction live bottom bin	**4.4**	65
X-104	Rotary Vibrating Screen	**1.1**	75
X-1101	PML loading conveyor	**8**	65
X-1102	PML discharge transfer conveyor	**2.2**	65
X-1103	PML live bottom bin	**4.4**	65
X-201	Displacement loading conveyor	**8**	65
X-202	Displacement live bottom bin	**4.4**	65
X-301	Piranha loading conveyor	**8**	65
X-302	Piranha discharge transfer conveyor	**2.2**	65
X-303	Piranha live bottom bin	**4.4**	65
X-304	Piranha return transfer conveyor	**4**	65
(Rectifier)	Copper Electrowinning Cell	**277**	42
P-803	Electrowinning circulation pump	**1.5**	65
P-804	Electrowinning circulation pump	**1.5**	65

Tag No	Description	Motor Rating, kW	Noise, dBA
P-805	Electrowinning circulation pump	**1.5**	65
P-806	Electrowinning circulation pump	**1.5**	65
C-1802	Blower for FP drying air #1	**90**	78
C-1803	Blower for FP drying air #2	**90**	78
F-1201	CYA Filter Press	**5**	65
F-1301	Biosorption Filter Press	**1.5**	65
F-1501	M(OH) Filter Press	**1.5**	65
F-501	M(OH) Filter Press	**9**	65
F-601	Gypsum Filter Press	**9**	65
F-601	Gypsum Filter Press	**9**	65
M-501	Magnesium Hydroxide Tank Agitator	**12**	65
M-601	Citric Acid Agitator	**3**	65
M-602	Ca(OH)2 Slurry Agitator	**9**	65
M-603	MgSO4 and Ca(OH)2 Mixing Tank Agitator	**9**	65
M-604	CaSO4 Precipitation Tank Agitator	**9**	65
P-601	Powder mixing pump	**11**	65
X-601	CaSO4 and Mg(OH)2 Separation Centrifuge	**140**	78

FOR INFORMATION

REV	DATE	DESCRIPTION	BY	CHK	APP
A	22.JUL.2021	FOR INFORMATION	LL	NM	NM

ETECH CUTTING EDGE FABRICATION
ETECH ENGINEERING SERVICES

CLIENT: Mint innovation

PROJECT: MINT INNOVATION COMMERCIAL PLANT FEED

TITLE: MINT INNOVATION COMMERCIAL PLANT PLOT PLAN (SHOWING OPERATIONAL EQUIPMENT LIST)

JOB NO.	2020003
SCALE	1:250
DRAWN	LL
CHECKED	NM
APPROVED	NM
DATE	22.JUL.2021

ALL DIMENSIONS IN MILLIMETERS UNLESS NOTED OTHERWISE

DWG. NO. MINT-EES-PL-001

REV. A

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