Bioscience

Integrating Resource Management

Equine Land Management Plan:
43 Windmill Avenue, Serpentine WA 6125

Prepared for Matthew Scott,
Landowner
August 2021

Equine Land Management Plan

43 Windmill Avenue, Serpentine WA 6125

Prepared by
Didier Alanoix
Environmental Scientist

Project Supervisor
Peter Keating
Managing Director

Bioscience Pty Ltd
488 Nicholson Road
Forrestdale 6112
9397 2446
www.biosciencewa.com

Document Control

Issue	Date	Author	Reviewer	Approved
1	30/10/2020	D. Alanoix	P. Keating	P. Keating
2	05/08/2021	D. Alanoix	P. Keating	P. Keating

Contents

Addendum – SJ Comments on Issue 1 (24/03/2021) and Response from Bioscience

SJ Comments	Response from Bioscience
1. Drainage Management Plan The subject site contains an easement for drainage purposes located along the southern and western boundaries which was created as part of the subdivision. The site is also mapped as a Resource Enhance Wetland. As the proposed paddocks are located within the drainage easement, further information is required in the form of a Drainage and Nutrient Management Plan detailing how water will be managed and the how the proposal will impact on the drain including its function and stability. It is suggested that we meet with yourself and the Shire's Engineers to discuss potential solutions. This management plan should also include information in relation to nutrient inputs/pathways to determine how the proposal will impact on the wetland and what measures are proposed to protect the wetland and the wider environment.	As discussed during the 20/05/2021 meeting at the Shire's office, drainage to the easement is no longer happening. It is also noted that recent cadastral boundaries (appearing on Landgate and Nearmap for instance) do not depict the easement. A Drainage and Nutrient Management Plan is therefore not required. For additional reassurance, no irrigation will occur within the former-easement area, i.e. paddocks L and K.
2. Equine Management Plan (EMP) *Stocking Rate:* As detailed in your application, the proposal exceeds the recommended stocking rate for the property. At this time, Officers have received an objection from the Department of Primary Industry and Regional Development (DPIRD). As such, are not currently in a position to support the proposal in its present form. This objection is attached for your review. It is suggested that you discuss these comments directly with DPIRD and Shire Officers to try to reach a resolution. The application will ultimately be presented to Council for deliberation. Alternatively, you may wish to consider removing the paddocks from the application and keeping horses in stable holding yards. It is considered that this would result in compliance with the stocking rate guidelines. In addition, the Equine Management Plan is required to detail the number of horses and the number of hours they will be on the paddocks to be able to determine the exact stocking rate.	*Stocking Rate:* A detailed stocking rate calculation is detailed in Section 3.3. The calculation takes in consideration the number of hours horses spend in the paddock and stables on a daily basis. To that end, a detailed horse program is presented in Section 3.3 of the document. We used a Site DSE of 29.32 as calculated by DPIRD and converted it in hours equivalent (i.e. 29.32 * 24 * 365). It was therefore determined that the total number of hours all the horses can spend within the paddocks on a yearly basis should not exceed 12,842 hours to not compromise the sustainability of the land. By increasing the number of stables from 11 to 20 (**Figure 11**), the number of hours horses are to spend in the paddocks will be around 11,000 hours and therefore will not exceed the Site DSE.

Composting: A 2m2 composting pad is proposed for composting manure prior to application in the paddock. The EMP is required to be updated to address the requirements of the Shire's Local Law including: • Manure for composting as fertiliser should be covered with a waterproof cover on a low permeability service to prevent fly breeding, liquid waste runoff and discharge to ground. • A storage volume that can be readily used within a reasonable period. Storage areas must be designed to hold all manure collected prior to disposal or use.	*Composting:* When collected, manure will be placed in trailers (3) and covered with a waterproof cover to prevent fly breeding, liquid waste runoff and discharge to ground. The manure will be removed off site regularly, 2 times a week.
Wastewater Management: The EMP proposes a contained wastewater management system. Collection and removal of wastewater for disposal off-site can be supported however further information is required and to be updated within the EMP to demonstrate the system is designed to collect and contain all wastewater expected from operations and normal seasonal rainfall events as follows: • Areas connected to the collection system should be roofed, to prevent uncontaminated stormwater runoff from mixing with the wastewater; • Spoon drain area should be bunded to ensure wastewater is contained; and • Wastewater system sizing calculations to be provided based on estimated hydraulic load and rainfall.	*Wastewater Management:* The washdown area has been redesigned to satisfy the Shire's comments. **Figure 10** details the washdown area. This area will be roofed to prevent uncontaminated stormwater runoff from mixing with washdown water. Washdown water will be directed by gravity to a bunded spoon drain to ensure washdown water is contained and directed to a collection sump (capacity 1500L). The sump will only collect washdown water. The sump is able to store 10 days of washdown water (150 L/day), and as such will be emptied once every 7 days to prevent overflow.
Manure and Feed Receptacles: The proposed manure collection does not comply with the requirements of the Shire's Health Local Law 1999. Manure collection and storage within the EMP is required to be updated to ensure compliance with section 67 of the Local Law. Manure receptacles must be designed to hold all manure collected prior to disposal or use, as follows:	*Manure and Feed Receptacles*: As discussed previously, when collected, manure will be placed in trailers (3) and covered with a waterproof cover to prevent fly breeding, liquid waste runoff and discharge to ground. The manure will be removed off site regularly, 2 to 3 times a week. Such practice was deemed compliant with section 67 pf the Local Law by SJ during the 20/05/2021 meeting.

67. Manure and Feed Receptacles (1) An owner or occupier of premises on which a stable is located shall subject to subsection (2) - (a) provide mobile or free standing fly-proof receptacles of a size, number and construction required by an Environmental Health Officer situated at not less than 15 metres from a dwelling house and into which shall be placed all wastes, inclusive of soiled bedding and manure produced on the premises; (b) keep the lids of the receptacles closed except when manure is being deposited or removed; (c) cause the receptacles to be emptied at least once a week and as often as may be necessary to prevent them becoming offensive or a breeding place for flies or other vectors of disease; (d) keep the receptacles so far as possible free from flies or other insects by spraying with a residual insecticide or other effective means; and (e) cause all manure produced on the premises to be collected daily and placed in the receptacles; and (f) the collection and storage or manure does not apply where horses are free ranging on land with an area greater than 2 hectares and no nuisance arising from the manure is created. (2) Every stable shall have approved impervious rat-proof receptacles for the storing of horse feed such as chaff, bran, pollard, grain or seed and the like.	
Dust Management: The proposed dust control measures are required to be updated to reflect best practice as follows: • Maintain minimum pasture height; • Paddock rotations; • Rotation of feeding areas and water troughs; • Coverage of bare areas; and • Minimising reticulation.	*Dust Management:* The applicant will establish the proposed best management practice. The report has been amended accordingly.
Noise: Further information is required detailing all potential noise sources from the proposal. This includes vehicle types (horse floats/trucks/trailers), vehicle movements, times of movements and how all these noise sources will be managed. This can be contained within the Equine Management Plan or you may wish to provide a separate Noise Management Plan prepared by a suitably qualified consultant to support your application.	*Noise:* In addition to the management proposed in Issue 1, the following has been added to the report: • No radios are on at any time. • Vehicle only has to start and go, no need to warm up brakes etc, hence preventing excess noise. • An agitated horse than can paw the ground in float, is put in the trailer last when leaving the site so it gets off first from the trailer to the stables when coming back from a race. In addition, such a horse would have its feet shackled so it cannot make excess noise by jumping in the trailer and or stables. • Feed delivery to the horses are done by walking. No vehicles are used to conduct the work, hence preventing noise. • The applicant will also liaise with the direct neighbours to mitigate any potential excess noise.

1 Introduction

1.1 Background

43 Windmill Avenue in Serpentine is a 2.6 ha property used has training ground for high-performance horses. Except when racing, horses are kept on site, either in paddocks or stables.

In an email sent 10 August 2020, the Shire of Serpentine-Jarrahdale informed the landowner of the site, Matthew Scott, that the property records do not include an historic approval for the keeping of horses at 43 Windmill Avenue. The Shire then requested the lodgement of a development application (DA) to validate the existing development onsite. This Equine Land Management Plan (ELMP) is part of the DA.

1.2 Purpose and Scope of the ELMP

The purpose of this ELMP is to give assurance to the local authority that the keeping of horses on site will not adversely impact on the land, soil, water, air and vegetation of the premises and neighbouring lots.

To this end, and as suggested by the Shire, the scope of the ELMP will provide information addressing the following:

- Number and size of stock;
- Stabling times and paddock regime including irrigation;
- Nutrient Management;
- Protection of existing vegetation and any proposed revegetation;
- Management of drains, waterways and wetlands; and
- Management of waste and dust.

2 Current Land Use

2.1 Zoning

The site is zoned ‘Rural Living B’ under the Shire of Serpentine Jarrahdale Town Planning Scheme No.2 (TPS 2). The Rural Living B zone is intended to cater for rural residential development and ancillary rural related uses on a range of lots between two to four hectares in accordance with the objectives and guidelines of the Rural Strategy.

The use class ‘Stable’ is an ‘AA’ under TPS 2 which requires planning approval prior to commencement of the use occurring. The use is defined within TPS 2 as; “any land, building or structure used for the housing, keeping and feeding of horses, asses and mules and associated incidental activities.”

The Shire is therefore required to assess impacts from the land use on nearby properties (odour, noise, dust etc.) if any, and if they can be appropriately managed.

2.2 Staff and Operating Times

In addition to Matthew Scott (landowner and trainer), the facility employs three full-timers, two casuals, and an apprentice jockey.

The facility does not have set operating times as it is dependant of racing days. On Tuesdays and Wednesdays, vehicles (horse trailers) leave the premises at 5 am to return around 7 pm. On Fridays, vehicles leave at 6 am to return at 10 pm. On these days, operations on site is minimal.

The remaining weekdays consist of training. Vehicles movements remain within the 7am-7pm timeframe.

2.3 Buildings and Features

The current buildings and features currently existing on site are shown on **Figure 1** and presented below:

- A 310 m^2 dwelling;
- 20 horse stables, adjacent to a washdown area.
- A storage shed;
- 13 horse paddocks with electric fences;
- A racetrack,
- shade sails in paddocks G, H and I;
- Sprinklers in all paddocks except for paddocks L and K, and,
- A 1,400 m^2 pond.

The sizes of the paddocks are described in **Table 1** below.

Table 1: Paddock Size

Paddock	Size (m^2)
A	2,900
B	1,240
C	1,380
D	1,220
E	1,940
F	1,690
G	780
H	700
I	910
J	390
K	500
L	1,200
M	1,000
Total	**15,850**

2.4 Horses

Up to 22 high-performance horses are kept on site. Horses are fed three times a day seven days a week with imported feed optimised for horse racing, i.e. high protein content (**Plate 1**). Feed is delivered once a week.

Horses do not graze on site. Grazing can trigger pasture-caused laminitis which would be detrimental to the horse performance.

Some horses will be placed in the stables overnight while other will remain in the paddocks. The facility provides the necessary safety and amenities to keep the horses safe.

Plate 1: Imported feed is stored in the existing shed (equivalent to one week of stock)

3 Environmental Context

3.1 Climate

The climate of the area is characterized by Mediterranean climate of cool wet winters and hot dry summers. Average monthly rainfall between 1905 and 2020 is shown in **Table 2**. The average yearly rainfall is 920.6 mm/year.

The Medina Research Centre is the closest weather station monitoring evaporation. Evaporation at the site is likely to be similar to Serpentine which has an annual evaporation of 1725 mm between 1983 and 2017. Average monthly evaporation in Medina is also presented in **Table 2**.

Evaporation exceeds the annual average rainfall by a factor of 1.9. Monthly rainfall typically only exceeds evaporation during four months from May to August.

The facility provides the necessary safety and amenities to keep the horses safe under the different weather conditions. Shelter (shade sails) and water troughs are provided on site to prevent heat stroke. Additional shade sails are also planned to be installed in paddocks A and F.

Table 2: Rainfall at Serpentine Weather Station and Evaporation at Medina Research Centre (Bureau of Meteorology)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (mm)	10.7	12.8	17.3	47.4	126.2	184.5	179.2	139.9	89.0	55.9	24.0	13.8	920.6
Average Evapo-ration (mm)	260	224	195	114	71	54	53	71	96	146	195	245	1725

3.2 Soil Type and Landform Description

3.2.1 Land Contours

The site is flat and lies at around 34 mAHD (**Figure 2**). Waterlogging occurs within the northern section of the site during the winter months, indicating a less elevated area.

3.2.2 Geological Soil Type

According to the GSWA mapping (**Figure 3**), the surface geology of the grounding consists of clayey peaty sand (Spc) within the mid-western section of the lot and of a thin layer of Bassendean Sand over the Guildford Formation (S10) within the remaining portion.

3.2.3 Morphological Soil Type

The morphological soil type of the land is related to the NRinfo mapping system of the Department of Primary Industries and Regional Development (**Figure 4**), where the site is mapped as Pinjarra P1b Phase; i.e. flat to very gently undulating plain with deep acidic mottled yellow duplex (or effective duplex) soils. Moderately deep pale sand to loamy sand over clay: imperfectly drained and moderately susceptible to salinity in limited areas.

3.2.4 Phosphorous Retention Index

The Phosphorous Retention Index (PRI) describes the ability of the soil to retain phosphorous. Soil within the Peel Harvey catchment area is known for its low Phosphate binding, showing PRIs of 2-5 or even lower (EPA 2008). Bassendean Sand, as found on the site, is a typical surface formation of the Peel-Harvey catchment with very low PRI. The clayey peaty sand however, would have a PRI value nearing 10, indicating a better phosphorus retention.

3.2.5 Acid Sulphate Soil (ASS)

The Acid Sulfate Soil (ASS) Risk Map provided by the Department of Water and Environmental Regulation (DWER) defines the area as Class 2 - moderate to low risk of within the southern part of the site but Class 1 – high to moderate risk of ASS within its northern part (**Figure 5**).

3.3 Site DSE and Stocking Rate

3.3.1 Site DSE

As discussed in Section 2.3, the site has 15,850 m^2 of available land (i.e. horse paddocks) (among which 14,150 m^2 to be irrigated) to grow pasture. As mentioned in Section 3.2.3, the site is mapped as Pinjarra P1b Phase which corresponds to a SR4 stocking rate land unit.

SR4 stocking rate land unit has a recommended dry stocking rate of 6 DSE/ha and an irrigated stocking rate of 20 DSE/ha. Given that the horse paddocks are all irrigated, the premises count a total of 29.32 DSE (20 DSE/ha x 1.415 ha + 6 DSE/ha x 0.17).

3.3.2 Stocking Rate

The stocking rate calculation must take in consideration the number of hours horses spend in the paddocks and stables on a daily basis. To that end, a detailed horse program is discussed below. Then, in order to assess the sustainability of the land, the Site DSE, converted in hours equivalent (i.e. 29.32 * 24 * 365 = 12,842 hours), will be compared to the stocking rate (number of hours horses spend in paddocks, which is itself determined from the horse program).

3.3.2.1 Horse Program

The typical horse program is summarised in **Table 3** below.

Table 3: Typical Horse Program

Days	Description
Monday	The 22 horses will remain at 43 Windmill Avenue. Each of them will train 1 hour in the paddocks / track. Rest for the remaining hours: 20 horses in stables, 2 in paddocks
Tuesday	4 to 6 horses will be training at Lark Hill 3 other horses will be out racing 14 horses will remain at 43 Windmill Avenue and train 1 hour in the paddocks / track
Wednesday	9 to 12 horses will be in Jandakot for track work 1 to 4 will have a day off and remain in the stables 6 to 8 horse will remain at 43 Windmill Avenue and train 1 hour in the paddocks / track
Thursday	20 to 21 horses will remain at 43 Windmill Avenue and train 1 hour in the paddocks / track 1 will be racing
Friday	15 to 16 horses will remain at 43 Windmill Avenue to train 1 hour in the paddocks / track 6 to 7 will be racing
Saturday	13 horses will remain at 43 Windmill Avenue Out of these 13 horses, 6 horses will have a day off and remain in the stables while the rest will undergo 1 hour training in the paddocks / track 4 to 6 horses will be in Lark Hill 5 to 8 horses will be in Jandakot
Sunday	The 22 horses will remain at 43 Windmill Avenue and rest (20 horses in stables, 2 in paddocks)

3.3.2.2 Stocking Rate Calculations

Table 4 and **Table 5** below presents the rational behind the stocking calculation. The total hours horses spend in the paddocks are calculated and compared to the Site DSE (in hours equivalent). As seen in Table 5, by increasing the number of stables from 11 (Issue 1 of the NIMP) to 20 (Figure 11), the number of hours horses are to spend in the paddocks will be around 11,000 hours and therefore will not exceed the Site DSE.

Table 4: Hours in paddocks from horse program

Days	Outside Activities			On-Site Activities					Resting Time and Location		
	Outside activities	Location	Number of horses involved in outside activities	Number of horses remaining at 43 Windmill Ave	Number of horses with a day off (i.e. resting in stables)	Number of horses going through training before resting in stables	Training Duration (Hours)	Total number of hours in paddock during on site activites	Number of horses resting in stables	Number of horses resting in paddocks	Total number of hours in paddock during resting time
Monday	No outside activities	Not applicable	0	22	0	22	1	**22**	20	2	**46**
Tuesday	Training	Lark Hill	8	14	0	14	1	**14**	14	0	**0**
Wednesday	Track work	Jandakot	9	13	1	12	1	**12**	13	0	**0**
Thursday	Race	Race venue	1	21	0	21	1	**21**	20	1	**23**
Friday	Race	Race venue	6	16	0	16	1	**16**	16	0	**0**
Saturday	Training	Lark Hill and Jandakot	9	13	6	7	1	**7**	13	0	**0**
Sunday	No outside activities	Not applicable	0	22	22	0	1	**0**	20	2	**48**

Table 5: Hours in paddocks from horse program

Site DSE	DSE of a 1,000 kg horse	DSE Equivalent (number of 1,000 kg horse in paddock 24 hours a day all year)	Site DSE (hours equivalent)	Hours of paddock use per week (hrs) (as per Table)	Hours of paddock use per year (hrs) - Stocking Rate
29.32	20	1.466	12,842	209	10,868

3.4 Geomorphic Wetlands

As seen on **Figure 6**, the site is depicted as having a Multiple Use wetland (MUW UFI 7707) surrounded by Resource Enhancement wetland (REW UFI 15364). It is noted that the mapping is in error. Even though the northern section of the premises is waterlogged during the winter months, the entirety of the depicted aera does not have environmental assets or features typical of a REW. This section of the site should rather be depicted as Multiple Use.

3.5 Groundwater

Based on **Figure 7**, groundwater flows westerly and is deemed to be close to ground level during winter months.

3.6 Surface Water

A pond exists on site. Given the local geology, this pond is likely clay-lined. Also, as mentioned in Sections 3.2.1 and 3.4, the northern section of the premises gets waterlogged during winter months. Depending of the amount of rainfall, runoff towards the neighbouring lot (located east) is suspected.

3.7 Existing Vegetation

Remnant eucalyptus species exist near the southern and northern western boundaries of the site (**Figure 1**). Small trees exist within paddock D. Trees located within the northern portion of the site where Class 1 ASS occurs, seem to be dying.

4 Current Land Management and Concerns

4.1 Waste Management

4.1.1 Manure and Nutrient Management

Horses kept within the premises produce 8 to 10 droppings a day, with 80% of these droppings occurring between the morning feed and afternoon.

Manure is picked up daily in the paddocks and stored in 3 trailers (**Figure 9**) prior to be disposed off site every Wednesday and Saturday. The trailers are covered with a waterproof cover to prevent fly breeding, liquid waste runoff and discharge to ground. Manure collection is done every afternoon to ensure that most of the daily droppings are collected, hence minimising potential environmental impacts. Such a practice is deemed adequate in

preventing nutrient export into the environment and is therefore in accordance with the objectives of the Water Quality Improvement Guidelines of the Peel Harvey Catchment.

4.1.2 Washdown Water

Horses and equipment are washed near the stables daily (**Figure 1**). Currently, the washdown water runs off the concrete hardstand (**Figure 9**) and potentially ends up leaching into the ground or within the existing pond. Although the washdown water is unlikely to contain high level of nutrients, continuous use of this routine without water containment might end up being adverse for the environment.

4.2 Dust Management

As seen on **Figure 1**, except within paddocks L and K, sprinklers were installed throughout the premises. As such, in the event of a windy day, dust on site will be managed by irrigation.

It is emphasised that irrigating the paddocks and track every morning is already an established routine on site. Sprinklers are controlled from a panel located in the existing dwelling. The facility provides therefore the necessary amenities to manage dust efficiently. The shire however requested additional best management practices which will be discussed in section 5 of this report.

4.3 Waterlogging

As mentioned in Sections 3.4 and 3.6 of this report, the northern section of the premises gets waterlogged during the winter months. Depending of the amount of rainfall, runoff towards the neighbouring lot located east is suspected. This might pause concerns if unmanaged.

Currently no management is established within the facility to reduce the waterlogging or its impact.

4.4 Protection of Vegetation

As mention in Section 3.7, remnant eucalyptus species exist near the southern and northern western boundaries of the site (**Figure 1**). Although trees located near the southern boundaries look healthy, the ones within the northern portion of the site seem to be dying (**Plate 2**).

Plate 2: Trees located in the northern portion of the site

4.5 Noise Management

As mentioned in Section 2.2, on Fridays, vehicles (including horse trailers) return on site at around 10 pm. Noise from the driving and offloading of horses onto the stables might be an issue for the nearby neighbours.

4.6 Conclusion

Table 3 below present a summary of the current management and concerns on site.

Table 3: Summary of current management and concerns

Category	Concerns	Management	Adequacy
Manure and Nutrient Management	Nutrient export	Daily manure collection in all paddocks with off site disposal twice a week.	No concerns. Management is deemed adequate to prevent nutrient export.
Washdown Water	Runoff to pond and leaching to groundwater	No management is currently established to prevent runoff to the existing pond or leaching to groundwater	Not adequate. Proper management will be established.

Dust Management	Dust impacts on horses, staff and neighbouring lots	Dust is managed via irrigation. Sprinklers are installed within the site. Paddocks L and K do not have sprinklers installed but have trees to control easterly winds.	No concerns. Management is deemed adequate to control dust.
Waterlogging	Runoff to neighbouring lot	No management is currently established to prevent runoff to neighbouring lot	Not adequate. Proper management will be established.
Protection of Vegetation	Dying vegetation	No management is currently established to protect vegetation within the northern portion of the site.	Not adequate. Proper management will be established.
Noise Management	Impact of the neighbourhood livelihood and sleep	Currently no management is established within the facility to reduce noise when returning late from a racing day.	Not adequate. Proper management will be established.

5 Proposed Management Plan

In response to the elements presented in **Table 3**, the proponent proposes to establish management actions to address the concerns listed in the table. **Table 4** below, presents these management actions, while **Figure 8** and **Figure 10** offer a visual display of the management plan.

Table 4: Proposed management plan

Category	Concerns	Proposed Management
Manure and Nutrient Management	Nutrient export	The current management, as described in Table 3 is deemed adequate.
Washdown Water	Runoff to pond and leaching to groundwater	Installation of a dedicated roofed washdown are, with runoff directed to a spoon drain discharging into a 1500 L sump for full containment of washdown water (**Figure 10**).
Dust Management	Dust impacts on horses, staff and neighbouring lots	The current management, as described in Table 3 is deemed adequate, however, the following best management practices will be added: • Maintain minimum pasture height; • Paddock rotations; • Rotation of feeding areas and water troughs; • Coverage of bare areas; and • Minimising reticulation.

Waterlogging	Runoff to neighbouring lot	• Increase the ground elevation of the waterlogged area by 100 mm to reduce waterlogging (**Figure 8**). • Proposed revegetation of the northern portion of the site using wetland adapted species to further reduce waterlogging and hence runoff to the neighbouring lot (**Figure 8**).
Protection of Vegetation	Dying vegetation	• An ASS investigation will be conducted. • Creation of a Horse Temporary Stay Area (HTSA) to protect newly established trees from horses (**Figure 8**).
Noise Management	Impact of the neighbourhood livelihood and sleep	• Neighbours will be made aware of late arrival. • The applicant will also liaise with the direct neighbours to mitigate any potential excess noise. • Noise complaints book to be used for constant improvement. • Trucks' exhaust braking will not be used when coming back to the facility after 7 pm. • An agitated horse than can paw the ground in float, is put in the trailer last when leaving the site so it gets off first from the trailer to the stables when coming back from a race. In addition, such a horse would have its feet shackled so it cannot make excess noise by jumping in the trailer and or stables. • Feed delivery to the horses are done by walking. No vehicles are used to conduct the work, hence preventing noise. • No radios are on at any time.

5.1 Full Containment of Washdown Water

In order to prevent washdown water discharging into the existing pond or leaching to groundwater, it is proposed to install a spoon drain within the dedicated roofer washdown area (**Figure 10**). This spoon drain is to discharge into a 1500 L sump made of concrete. The sump will have the capacity to accommodate the equivalent of 10 days' worth of washdown activities. The sump is proposed to be emptied weekly with wastewater disposed off site via a third-party licenced contractor.

The discharge point to the sump will be installed with a valve. The valve will be closed outside washdown activities to prevent rainfall from reducing the storage capacity of the sump.

5.2 Reduction of the Waterlogging

5.2.1 Fill

The proponent proposes to elevate the ground within the waterlogged area by 100 mm to reduce the effect of the waterlogging induced by perched water.

5.2.2 Revegetation of the Northern Portion of the Site

As seen on **Figure 8**, the northern portion of the site is proposed to be revegetated with wetland-adapted trees to further reduce the waterlogging occurring within the area. Local native species, resistant to acidic soils are proposed to be planted.

5.3 Protection of the Proposed Trees

In order to protect the new planted trees, the proponent proposed to keep the horses into a Horse Temporary Stay Area (HTSA) (**Figure 8**). The HTSA will be delimited by the installation of a temporary fence preventing the horses from reaching the new trees. Additional shade sails will also be installed to protect the horses from the impact of the sun.

The HTSA will be removed when the trees are deemed safe from the horses.

5.4 Noise Reduction Outside Operating Hours

As mentioned previously, on Fridays, vehicles (including horse trailers) return on site at around 10 pm. Noise from the driving and offloading of horses might become an issue for the nearby neighbours.

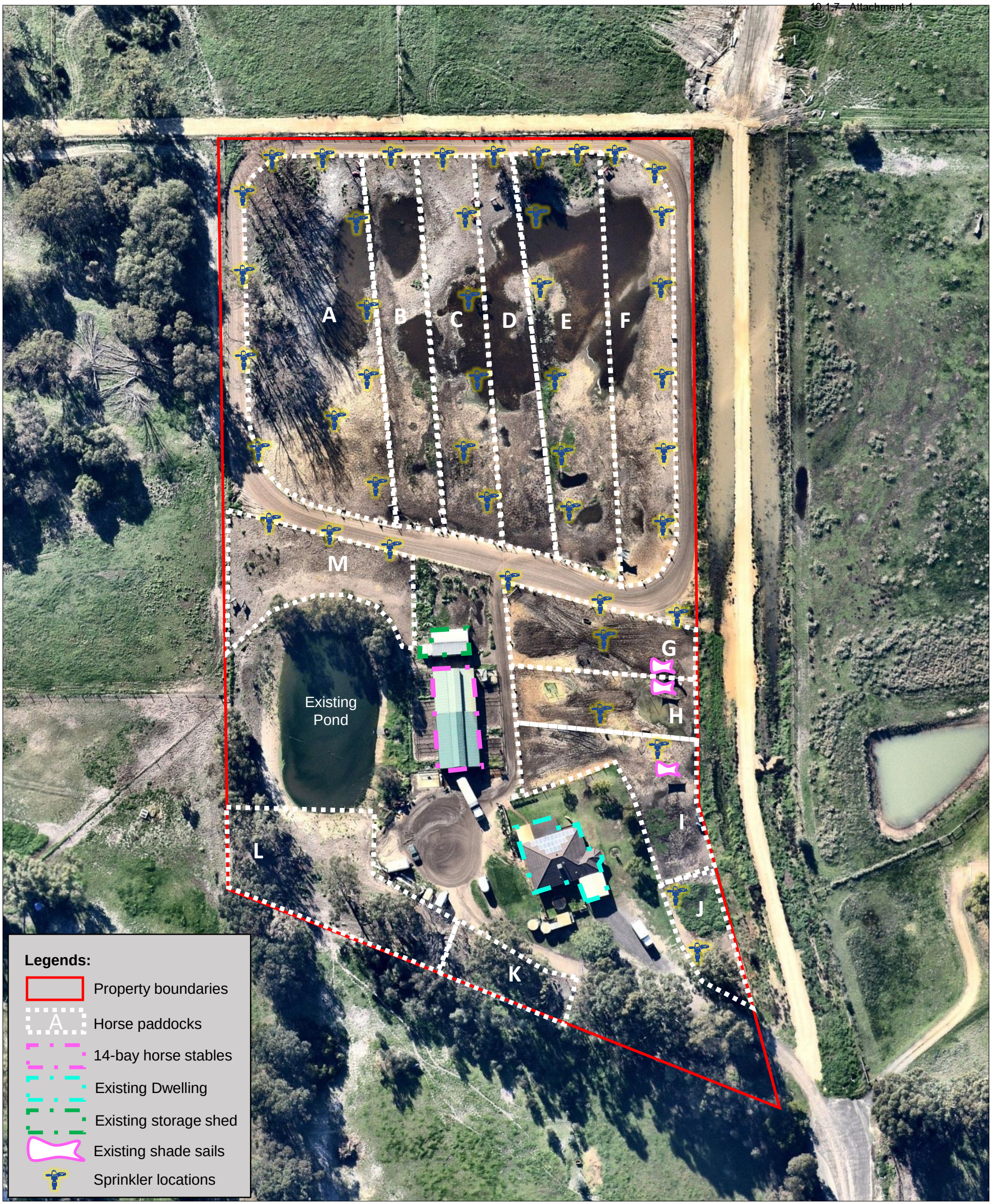
To prevent any impact of his neighbours' livelihood, the proponent proposes the following:

- Neighbours will be made aware of late arrival.
- The applicant will also liaise with the direct neighbours to mitigate any potential excess noise.
- Noise complaints book to be used for constant improvement.
- Trucks' exhaust braking will not be used when coming back to the facility after 7 pm.
- Agitated horse than can paw the ground in float, is put in the trailer last when leaving the site so it gets off first from the trailer to the stables when coming back from a race. In addition, such a horse would have its feet shackled so it cannot make excess noise by jumping in the trailer and or stables.
- Feed delivery to the horses are done by walking. No vehicles are used to conduct the work, hence preventing noise.
- No radios are on at any time.

6 Staging

Upon approval of this ELMP the proponent will start the proposed management actions. The proposed management practices will be established within 12 months of approval.

Figures



Bioscience

Integrating Resource Management

Project: ELMP
Client: Matthew Scott
Date: 16/10/2020
Drawn: DA
Checked: PK
Revision: A

0m 10m 20m 30m

BIOSCIENCE PTY LTD

488 NICHOLSON ROAD FORRESTDALE WA 6112
PO BOX 5466 CANNINGVALE SOUTH WA 6155
PHONE: (08) 9397 2446 FAX: (08) 9397 2447
EMAIL: bioscience@biosciencewa.com
WEBSITE: www.biosciencewa.com

FIGURE 1. Current Buildings and Features

43 WINDMILL AVENUE, SERPENTINE WA 6125

SOURCE: Nearmap and site visit

Bioscience

Integrating Resource Management

Project: ELMP
Client: Matthew Scott
Date: 29/10/2020
Drawn: DA
Checked: PK
Revision: A

BIOSCIENCE PTY LTD

488 NICHOLSON ROAD FORRESTDALE WA 6112
PO BOX 5466 CANNINGVALE SOUTH WA 6155
PHONE: (08) 9397 2446 FAX: (08) 9397 2447
EMAIL: bioscience@biosciencewa.com
WEBSITE: www.biosciencewa.com

FIGURE 2. LiDAR

43 WINDMILL AVENUE, SERPENTINE WA 6125

SOURCE: DWER Database

Bioscience

Integrating Resource Management

Project: ELMP
Client: Matthew Scott
Date: 29/10/2020
Drawn: DA
Checked: PK
Revision: A

BIOSCIENCE PTY LTD

488 NICHOLSON ROAD FORRESTDALE WA 6112
PO BOX 5466 CANNINGVALE SOUTH WA 6155
PHONE: (08) 9397 2446 FAX: (08) 9397 2447
EMAIL: bioscience@biosciencewa.com
WEBSITE: www.biosciencewa.com

FIGURE 3. Geology

43 WINDMILL AVENUE, SERPENTINE WA 6125

SOURCE: GSWA

Bioscience

Integrating Resource Management

Project: ELMP
Client: Matthew Scott
Date: 29/10/2020
Drawn: DA
Checked: PK
Revision: A

BIOSCIENCE PTY LTD

488 NICHOLSON ROAD FORRESTDALE WA 6112
PO BOX 5466 CANNINGVALE SOUTH WA 6155
PHONE: (08) 9397 2446 FAX: (08) 9397 2447
EMAIL: bioscience@biosciencewa.com
WEBSITE: www.biosciencewa.com

FIGURE 4. NRinfo Mapping

43 WINDMILL AVENUE, SERPENTINE WA 6125

SOURCE: DPIRD Database

Bioscience

Integrating Resource Management

Project: ELMP
Client: Matthew Scott
Date: 29/10/2020
Drawn: DA
Checked: PK
Revision: A

BIOSCIENCE PTY LTD

488 NICHOLSON ROAD FORRESTDALE WA 6112
PO BOX 5466 CANNINGVALE SOUTH WA 6155
PHONE: (08) 9397 2446 FAX: (08) 9397 2447
EMAIL: bioscience@biosciencewa.com
WEBSITE: www.biosciencewa.com

FIGURE 5. ASS Risk Mapping

43 WINDMILL AVENUE, SERPENTINE WA 6125

SOURCE: DWER database

Bioscience

Integrating Resource Management

Project: ELMP
Client: Matthew Scott
Date: 29/10/2020
Drawn: DA
Checked: PK
Revision: A

BIOSCIENCE PTY LTD

488 NICHOLSON ROAD FORRESTDALE WA 6112
PO BOX 5466 CANNINGVALE SOUTH WA 6155
PHONE: (08) 9397 2446 FAX: (08) 9397 2447
EMAIL: bioscience@biosciencewa.com
WEBSITE: www.biosciencewa.com

FIGURE 6. Geomorphic Wetlands

43 WINDMILL AVENUE, SERPENTINE WA 6125

SOURCE: DWER database

Bioscience

Integrating Resource Management

Project: ELMP
Client: Matthew Scott
Date: 29/10/2020
Drawn: DA
Checked: PK
Revision: A

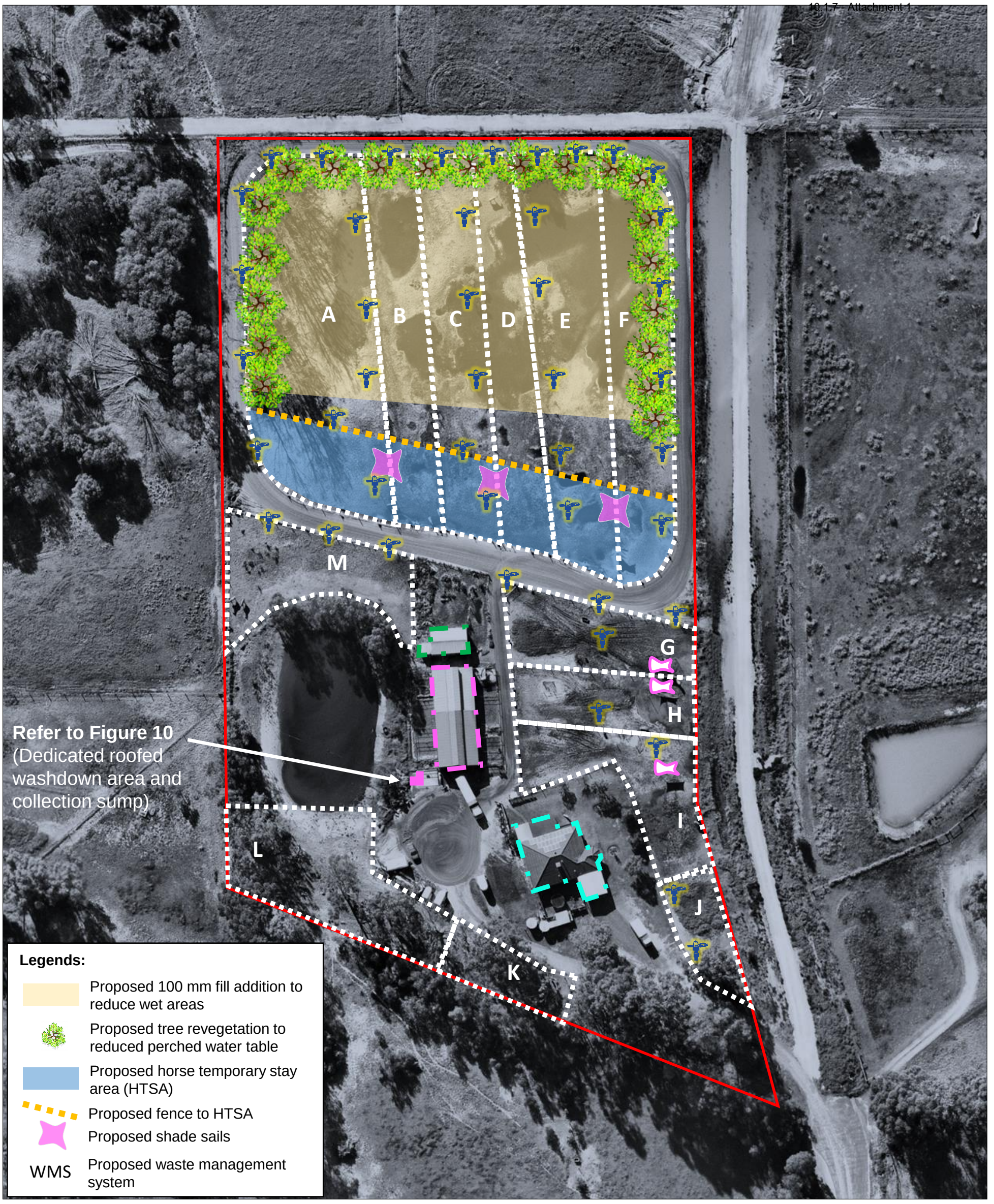
BIOSCIENCE PTY LTD

488 NICHOLSON ROAD FORRESTDALE WA 6112
PO BOX 5466 CANNINGVALE SOUTH WA 6155
PHONE: (08) 9397 2446 FAX: (08) 9397 2447
EMAIL: bioscience@biosciencewa.com
WEBSITE: www.biosciencewa.com

FIGURE 7. Groundwater Contours

43 WINDMILL AVENUE, SERPENTINE WA 6125

SOURCE: DWER database



Bioscience

Integrating Resource Management

Project: ELMP
Client: Matthew Scott
Date: 16/10/2020
Drawn: DA
Checked: PK
Revision: A

0m 10m 20m 30m

BIOSCIENCE PTY LTD

488 NICHOLSON ROAD FORRESTDALE WA 6112
PO BOX 5466 CANNINGVALE SOUTH WA 6155
PHONE: (08) 9397 2446 FAX: (08) 9397 2447
EMAIL: bioscience@biosciencewa.com
WEBSITE: www.biosciencewa.com

FIGURE 8. Proposed Management Plan

43 WINDMILL AVENUE, SERPENTINE WA 6125

SOURCE: Nearmap and site visit

CURRENT WASTE MANAGEMENT

A: CURRENT WASHDOWN AREA.

ISSUE: UNCONTAINED WASTEWATER (AS SEEN ON PICTURE)
CURRENT MANAGEMENT: NONE CURRENTLY. PROPOSED MANAGEMENT SHOWN ON FIGURE 10

B: MANURE COLLECTED DAILY FROM HORSE PADDOCKS IS STOCKPILED IN TRAILER

STOCKPILE COVERED WITH A TARP TO PREVENT RUNOFF AND FLY BREEDING
CURRENT MANAGEMENT: REMOVED OFF SITE EVERY WEDNESDAY AND SATURDAY. MANAGEMENT DEEMED ADEQUATE

ENVIRONMENTAL CONTEXT

ISSUE: RUNOFF OF UNCONTAINED WASTEWATER POTENTIALLY REACHING DAM
CURRENT MANAGEMENT: NONE CURRENTLY. PROPOSED MANAGEMENT SHOWN OF FIGURE 10

Bioscience

Integrating Resource Management

Project: ELMP
Client: Matthew Scott
Date: 05/08/2021
Drawn: DA
Checked: PK
Revision: B

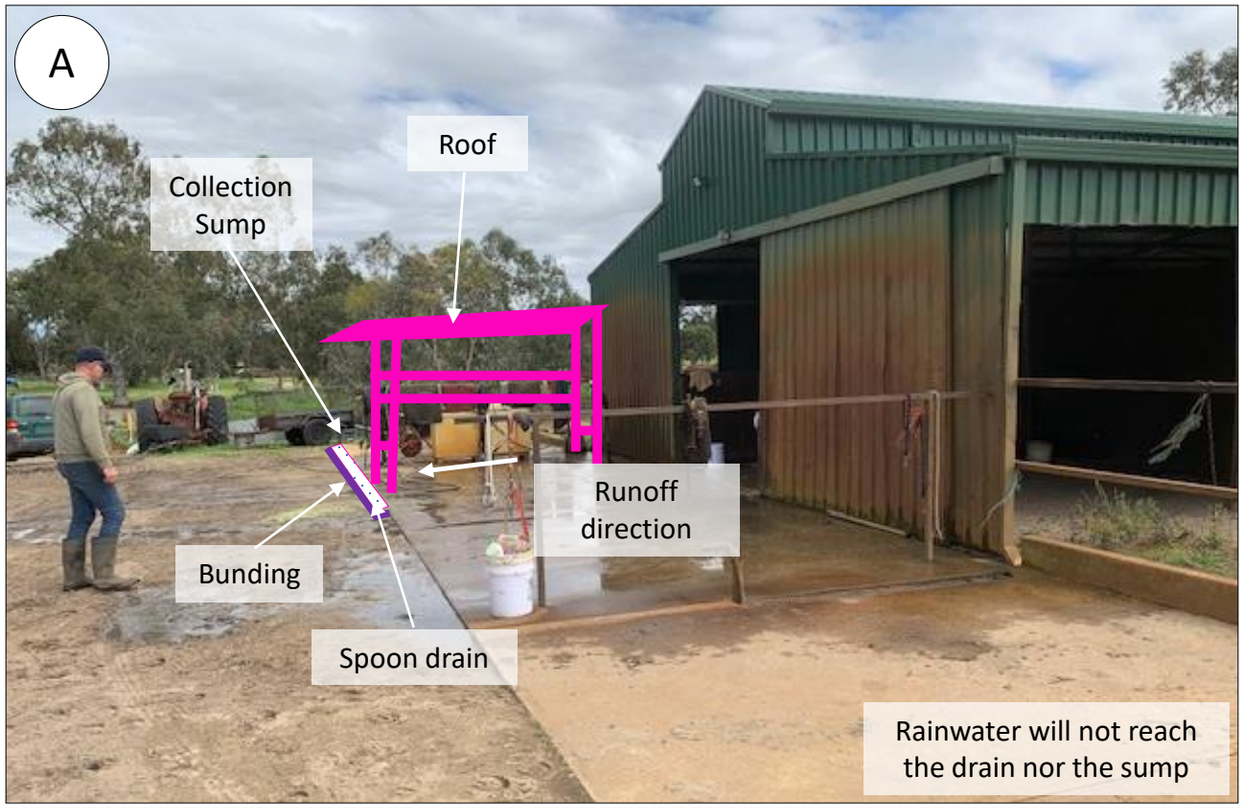
BIOSCIENCE PTY LTD

488 NICHOLSON ROAD FORRESTDALE WA 6112
PO BOX 5466 CANNINGVALE SOUTH WA 6155
PHONE: (08) 9397 2446 FAX: (08) 9397 2447
EMAIL: bioscience@biosciencewa.com
WEBSITE: www.biosciencewa.com

FIGURE 9. Current Waste Management

43 WINDMILL AVENUE, SERPENTINE WA 6125

SOURCE: Site visit



PROPOSED WASTE MANAGEMENT

A: DEDICATED ROOFED WASHDOWN AREA.
PROPOSED MANAGEMENT: INSTALLATION OF A SPOON DRAIN DISCHARGING INTO A 1500 L SUMP FOR FULL CONTAINMENT OF WASHDOWN WATER

B: MANURE COLLECTED DAILY FROM HORSE PADDOCKS IS STOCKPILED IN TRAILERS AND COVERED WITH A TARP TO PREVENT RUNOFF AND FLY BREEDING.
CURRENT MANAGEMENT IS DEEMED ADEQUATE, THEREFORE NO CHANGE TO THE CURRENT ROUTINE

ENVIRONMENTAL CONTEXT
PROPOSED MANAGEMENT: 1500 L SUMP TO COLLECT WASHDOWN WATER. SUMP TO BE EMPTIED ONCE A WEEK. WASTEWATER TO BE REMOVED OFF SITE TO AN APPROPRIATE LICENSED LANDFILL SITE.
TAP TO BE INSTALLED TO SPOON DRAIN TO PREVENT ACCUMULATION OF STORMWATER INTO SUMP.

.

Bioscience
Integrating Resource Management

Project: ELMP
Client: Matthew Scott
Date: 05/08/2021
Drawn: DA
Checked: PK
Revision: B

DRAWING NOT TO SCALE

BIOSCIENCE PTY LTD

488 NICHOLSON ROAD FORRESTDALE WA 6112
PO BOX 5466 CANNINGVALE SOUTH WA 6155
PHONE: (08) 9397 2446 FAX: (08) 9397 2447
EMAIL: bioscience@biosciencewa.com
WEBSITE: www.biosciencewa.com

FIGURE 10. Proposed Waste Management

43 WINDMILL AVENUE, SERPENTINE WA 6125

SOURCE: Proposal

Legends

12 Proposed stables
(roofed with hardstand floor)

Conceptual Representation

Might look different when built

Bioscience

Integrating Resource Management

Project: ELMP
Client: Matthew Scott
Date: 05/08/2021
Drawn: DA
Checked: PK
Revision: A

DRAWING NOT TO SCALE

BIOSCIENCE PTY LTD

488 NICHOLSON ROAD FORRESTDALE WA 6112
PO BOX 5466 CANNINGVALE SOUTH WA 6155
PHONE: (08) 9397 2446 FAX: (08) 9397 2447
EMAIL: bioscience@biosciencewa.com
WEBSITE: www.biosciencewa.com

FIGURE 11. Layout of Stables

43 WINDMILL AVENUE, SERPENTINE WA 6125

SOURCE: Proposal