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Jon Howell
Development Project Manager
URBNSURF
Email: Jonathan@urbnsurf.com

Cumberland Ecology
PO Box 2474
Carlingford Court 2118
NSW Australia
Telephone (02) 9868 1933
ABN 14 106 144 647
Web: www.cumberlandecology.com.au

Biodiversity Impact Statement for a wave park at Sydney Olympic Park

Dear Jon,

Cumberland Ecology has been requested by URBNSURF (the 'client') to prepare a Biodiversity Impact Statement to accompany an application for modification (SSD-7942-Mod-1) of an existing State Significant Development (SSD) application (SSD-7942) approval for a proposed wave park to be constructed at Sydney Olympic Park (the 'project'). Of relevance to this document, the proposed modification to the existing consent includes increased operating hours beyond those already approved.

Appendix A of this letter presents a Biodiversity Impact Statement for the project that has been prepared as an Addendum to the previously prepared Flora and Fauna Assessment (FFA) for the project. This includes a summary of the methodology implemented as well as our results and an assessment of the ecological impacts of the longer operating hours on the biodiversity values adjacent to the subject site.

Our assessment concluded that a significant impact is not expected to occur to any threatened species because of noise or light resulting from increased operational hours. The subject site and surrounding areas are already subject to relatively high levels of noise and light due to their location in an urban environment adjacent to existing development and busy roads. Furthermore, the proposed development has been redesigned which will result in reduced noise levels for the modification compared to under the original SSD application. Some minor increase in light levels will occur due to changes in the design, however fauna present are currently likely tolerant of light from existing and surrounding development and the minor increase is unlikely to cause a significant impact to any fauna species.

If you have any questions or wish to discuss the contents of this Biodiversity Impact Statement further, please do not hesitate to contact Bryan Furchert in our Sydney office on (02) 9868 1933.

Yours sincerely,

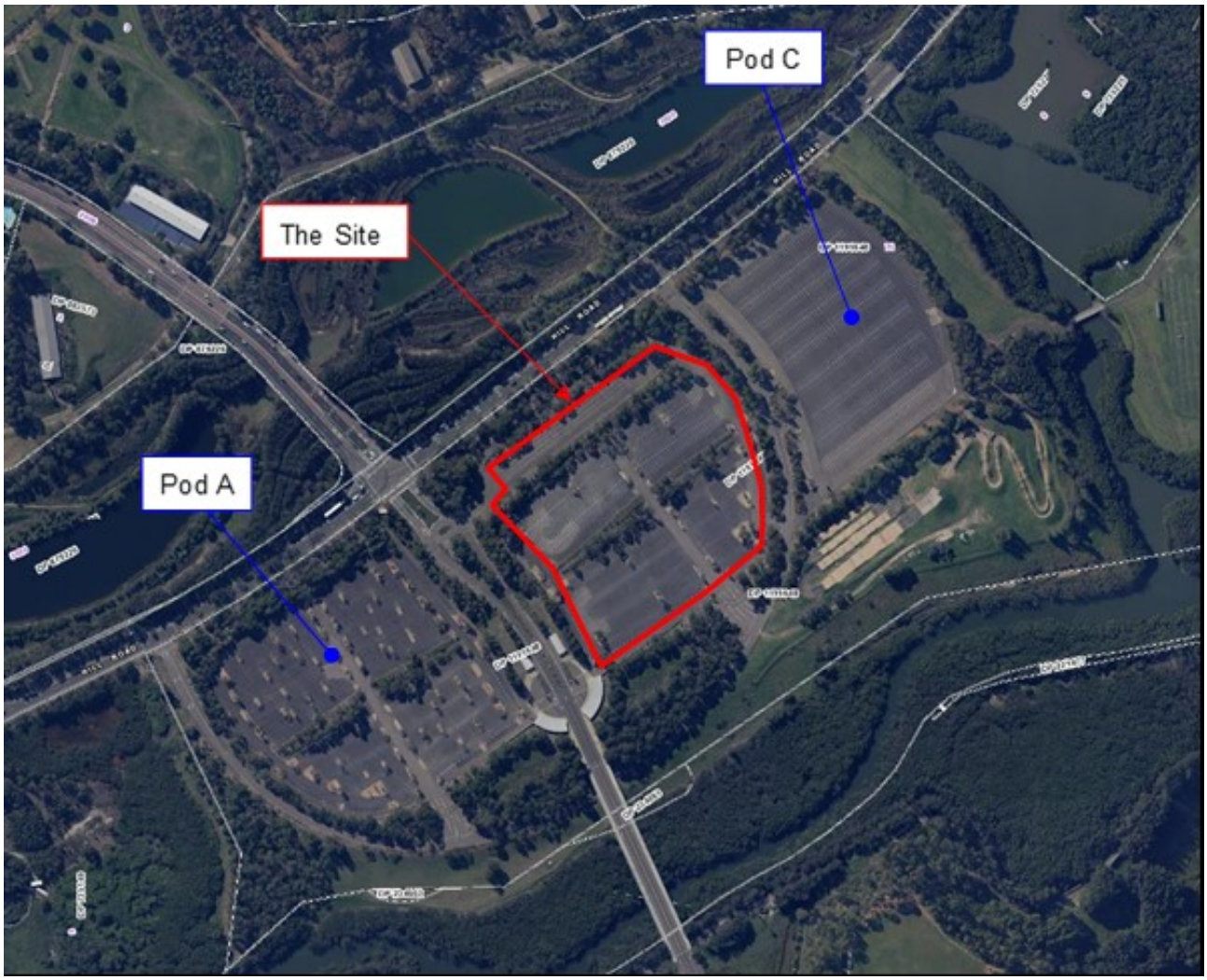
David Robertson
Director
David.Robertson@cumberlandecology.com.au

APPENDIX A :
Biodiversity Impact Statement

A.1. Background

Cumberland Ecology has been requested by URBNSURF (the 'client') to prepare a Biodiversity Impact Statement to accompany an application for modification (SSD-7942-Mod-1) of an existing State Significant Development (SSD) application (SSD-7942) approval, for a proposed wave park to be constructed at Sydney Olympic Park (the 'project'), known as URBNSURF Sydney. The location of the project is Pod B P5 Carpark, Hill Road, Sydney Olympic Park near the junction of Hill Road, Holker Busway and Holker Street (hereafter referred to as the 'subject site' -see **Figure 1**).

Figure 1 The subject site (from SLP Planning 2021)



The currently approved hours of operation of the proposed wave park are 6 am to 10 pm, seven days a week with the Café, restaurant and alfresco bar in the Main Entry Building able to operate from 6am to 12 midnight on Fridays and Saturdays only. It is understood that the client has submitted an application that seeks to modify the development consent for the project to facilitate the following (SJB 2021):

- Extension of the morning operating hours by opening one (1) hour earlier at 5 am rather than 6 am seven days a week.
- An additional two (2) hours of operation for the wave park by closing at 12 am on Fridays and Saturdays.

The extension to the morning and night time hours has arisen out of a need to provide access to the facility for a range of demographics including tradespeople and shift workers, as well as allow members of the public with extended commute times, access to surfing, recreation and the amenity offered by the facility. Travel restrictions for international visitors and interstate border uncertainty has also required the business to focus on local participation programs. Feedback from URBNSURF's Melbourne facility has indicated that there is an increasing demand for the early morning and night-time hours. Recently URBNSURF received approval for grant funding for a Surfing Centre of Excellence as part of the Greater Cities Sport Facilities Fund. The extended hours will allow athletes and coaches access to elite level training facilities outside of peak daytime hours which allows for more focussed training programs.

The modification application was publicly exhibited, and several submissions were received. These were addressed in a Response to Submissions document prepared by the client. The NSW Department of Planning, Industry and Environment (DPIE) reviewed the Response to Submissions and requested further information be provided in an addendum report to the Flora and Fauna Assessment (FFA) that was previously prepared by Applied Ecology (2017) to support the approved project.

The requirements of DPIE relevant to ecology are reproduced verbatim below in italics.

1. Lighting

Further information is required on lighting impacts on nocturnal fauna. These potential impacts have also been raised by SOPA and were not addressed in the RTS.

The Flora and Fauna Assessment report submitted with the original EIS, provided an assessment of lighting impacts on fauna, based on five, 25 m high lighting poles and operating hours till 10 pm.

An addendum to the Flora and Fauna Assessment report shall be submitted, providing an assessment of the lighting impacts of the extended hours of operation and revised lighting design, (which now includes six, 30 m high lighting poles) on fauna.

The difference between the lighting design submitted with the EIS and the proposed lighting design in regard to any additional lighting spill to the nature reserve shall be quantified.

2. Noise

a) An addendum to the Flora and Fauna Assessment report submitted with the original EIS shall be submitted, providing an assessment of any noise impacts of the extended hours of operation on fauna.

b) The Noise Impact Assessment (NIA) submitted with the original EIS provided an operational noise level of 44 dB(A) at the nearest sensitive receiver. The NIA submitted with the modification application provides an operational noise level of 32 dB(A) at the nearest sensitive receiver. An explanation as to why there is a reduction in the operational noise level shall be provided.

This Biodiversity Impact Statement has been prepared as an addendum to the existing FFA in order to address the requirements of DPIE identified above, and to provide further information relating to the impacts of light and noise on the biodiversity values of the subject site.

A.2. Methodology

The methodology used in the preparation of this Biodiversity Impact Statement comprised a detailed desktop assessment only as field surveys have previously been undertaken by Applied Ecology (2017) for the FFA that accompanied the original SSD application. The FFA adequately details the biodiversity values and fauna habitats present within the subject site for the proposed wave park and no additional surveys were considered necessary.

In addition to a detailed review of the FFA, Cumberland Ecology conducted a review of available literature including, but not limited to:

- National Light Pollution Guidelines for Wildlife prepared by the Department of the Environment and Energy (Commonwealth of Australia 2020);
- Acoustic Report and compliance letter prepared by Stantec Australia (2021a, b) for the proposed modification of the project;
- Lighting Plan and compliance letter prepared by Northrop (2021b, a)for the proposed modification of the project; and
- Response to Submissions provided by DPIE(DPIE 2021).

The impact assessment of the proposed lighting and noise on biodiversity has been based on the information contained within the Lighting Plan and Acoustic Report and compliance letters prepared by Northrop and Stantec Australia.

A.3. Description of the Project and Subject Site

A.3.1. The Project

The approved project is a wave park for recreational surfing. URBNSURF Sydney will be arranged around a large open water surf sports lagoon incorporating a Wavegarden surfing wave generator. The open water lagoon will comprise two zones with waves of different heights produced in each zone, allowing for beginners through to advanced surfers to be accommodated at the same time.

The maximum lagoon capacity is estimated at 84 participants per hour, with around half in each zone. Total attendance will include over 250,000 surfers annually, along with 75,000 other admissions, as well as numerous members of the general public. Attendances are expected to peak early mornings, after work, and on weekends. Car parking for approximately 180 cars will be required to cater for guests and staff. Other parking will be available in the adjoining P5 carpark Pods A and C.

The currently approved hours of operation are 6 am to 10 pm, seven days a week with the Café, restaurant, and alfresco bar in the Main Entry Building able to operate from 6am to 12am midnight on Fridays and Saturdays. The modification application seeks to amend the approved development by the following:

- Extend the morning operating hours by opening one (1) hour earlier at 5 am rather than 6 am seven days a week.
- An additional two (2) hours of operation for the wave park by closing at 12 am on Fridays and Saturdays.

The proposed lights will comprise Sylvania Raptor LED sports lighting floodlights. The floodlights will be directed downward and aimed at the basin and will be fitted with cut-off fixtures and back shields to limit spill light outside the subject site (Northrop 2021b).

A.3.2. The Subject Site

This section provides a brief description of the subject site based on the information presented in the FFA and review of recent aerial photography (**Figure 2**). Review of the most recently available aerial photography indicates that that the subject site has not changed substantially since the FFA was prepared in 2017 and the description of the biodiversity values is still expected to be accurate.

The subject site currently comprises a carpark, which is used for events parking at Sydney Olympic Park. No remnant or regrowth native vegetation is mapped as occurring on the subject site and native species are restricted to those used as landscape plantings from around 1999-2000, when the site was being prepared for use during the Sydney Olympic Games. Some colonisation by native species from surrounding areas has occurred since then but this is mainly limited to damp areas in the gabion lined swales, which were designed for stormwater treatment prior to discharge to nearby Narrawang Wetlands, a series of constructed wetlands located north/northwest of the subject site (Applied Ecology 2017). Other flora species recorded from the subject site included 43 weed species, with five species of weed listed as State Priority Weeds under the NSW *Biosecurity Act 2015* (Applied Ecology 2017). Detailed lists of all the flora and fauna species recorded from the subject site and adjacent areas are provided in the FFA.

Haslams Creek is located south and southeast of the site which has a narrow band of Estuarine Saltmarsh, an Endangered Ecological Community (EEC) listed under the NSW *Biodiversity Conservation Act 2016* (BC Act), along lengthy sections of creek bank near the subject site. Within this area a threatened flora species is present, Narrow-leaved Wilsonia (*Wilsonia backhousei*), listed as vulnerable under the BC Act. North and northwest of the subject site are the Narawang Wetlands, artificial and recreated habitat areas surrounded by established revegetation plantings and small areas of weeds.

Six species of birds were recorded on the subject site during field surveys by Applied Ecology in 2017 (Applied Ecology 2017). These were all common, highly mobile, mostly larger species, and well adapted to living in a highly urbanised environment. Trees within the subject site are too young to provide breeding habitat in the form of hollows. Three common species of small lizards were also recorded during field surveys, and a fourth is reportedly often sighted around the bioswales. Very little amphibian habitat is present on the subject site and no frog species were recorded during surveys conducted for the FFA (Applied Ecology 2017). No threatened species, endangered ecological communities, endangered populations, or critical habitat was

recorded on the subject site, although several were reported from nearby areas. Large populations of the Green and Golden Bell Frog (*Litoria aurea*), which is listed as endangered under the BC Act and vulnerable under the EPBC Act, have been recorded regularly in the nearby Narawang Wetlands, and this area is also believed to provide habitat for the EPBC Act listed migratory species Latham's Snipe (*Gallinago hardwickii*). The subject site is separated from the Narawang Wetland to the northwest by the busy Hill Road near the junction of Holker Road. Hill Road is a four-lane road with median strip and hard stand verges at this location. Frog fences have been erected along the perimeter of the wetland to prevent frogs, and other fauna, from dispersing from the wetland across Hill Road and Holker Road (Applied Ecology 2017).

Five threatened species of microbats (listed as vulnerable under the BC Act) have been recorded in the vicinity, with two of these frequenting the vicinity of the subject site: Eastern Bentwing Bat (*Miniopterus schreibersii oceanensis*) and Southern Myotis (*Myotis macropus*). Comprehensive species lists are provided in the FFA (Applied Ecology 2017).

A.4. Impact Assessment

This section provides an assessment of the impacts of the modification on the biodiversity values of the subject site and nearby areas. As required by the DPIE, this focuses on the impacts of increased operating hours and the changes to lighting and noise that are proposed by the modification. These changes are assessed individually below in subsequent subheadings.

A.4.1. Lighting

The FFA submitted with the original EIS (Applied Ecology 2017), provided an assessment of lighting impacts on fauna, based on five, 25 m high lighting poles and operating hours from 6 am till 10 pm. The proposed modification includes the construction of six, 30 m high lighting poles. This means that each pole is 5 m higher than approved, and there will be one more light pole, thereby resulting in some additional light spill to that which was approved. In addition, the impacts of light will be present for longer in each day due to the proposed extension of operating hours.

The impacts of lighting on fauna species were evaluated in the FFA for the approved project, and a range of potential impacts were identified including changes to foraging ability, mate choice and predator avoidance behavior (Applied Ecology 2017). The impacts of lighting on fauna as a result of the project were assessed as not significant in the FFA due to the lack of habitat for native fauna species on the subject site and the existing high levels of disturbance. The only fauna species assessed as likely to occur in the subject site were urban adapted, common species for which there are abundant habitats in the locality. This is still relevant and applicable to the proposed modification, and any increase in light levels in the subject site itself from the proposed changes are not expected to result in any significant impact to native fauna species as there are no known onsite sensitive receptors. However, nearby areas outside of the subject site contain higher biodiversity values including Narrawang Wetlands to the north of Hill Road, and the vegetation along Haslams Creek to the south, and it is relevant to assess the impacts of the increased lighting on these areas and the species they may contain.

A.4.1.1. Existing and Modelled Light Spill

As noted in the FFA, the subject site (existing carpark) is already illuminated at night with parking flood lights, and there are existing street lights on Hill Road that currently spill light into the Narrawang Wetlands. Accordingly, the adjacent habitats to the subject site are already substantially impacted by light during the night. Light modelling was conducted by Gerard Lighting (2017) for the approved development that divided the interface between the Narrawang Wetland and the subject site into 5 segments (see **Table 1** below) and light modelling was conducted for each segment (Please refer to Figure 44 of the FFA for mapping of the segments). This modelling indicated that existing light spill from street lights on Hill Road into the Narrawang Wetlands was up to a maximum of 0.6 lux (see **Table 1**). Additional lighting as a result of the approved project was also modelled, which indicated that a maximum of 0.5 lux additional light from the project would spill into the wetlands (see **Table 1**).

Recent modelling was conducted by Northrop (2021) for the proposed modification, taking into account the additional lighting pole and the additional 5 m height of the poles. This modelling indicates that the maximum additional illumination to the Narrawang Wetlands as a result of the current approved proposal is 2.3 lux (Northrop 2021). The light modelling conducted for the previously approved project and the proposed modification is presented below in **Table 1**. Note that the previous light modelling conducted by Gerard Lighting (2017) provided an indication of the combined light spill from the project and the existing light spill from street lights along Hill Road. The light modelling of the proposed modification conducted by Northrop (2021) does not include combined light spill and therefore these data have not been presented in **Table 1** for comparison.

Table 1 Existing and modelled light spill into Narrabeen Wetlands

Segment	Existing light spill (from Gerard Lighting 2017)	Approved project (from Gerard Lighting 2017)	Proposed modification (from Northrop 2021)	
		Illumination (lux)		Change in Illumination (lux)
Segment 1	0.6	0.2	0.6	0.4
Segment 2	0.4	0.3	1.0	0.7
Segment 3	0.6	0.2	1.4	1.2
Segment 4	0.6	0.5	2.3	1.8
Segment 5	0.4	0.1	1.2	0.2

These results indicate that the level of light spill to the Narrawang Wetlands as a result of the proposed modification will exceed existing levels for all segments for which monitoring was conducted and will also exceed the previously approved level of light spill.

Although it is clear that an increase in light illumination of nearby areas will occur, it is difficult to quantify the impacts of light exposure on native species. While significant research has been completed on the impacts of light spill on fauna species, these focus mainly on the impacts of newly introduced light into an area that has not previously been subject to light impacts. However, the subject site is located in a highly urban environment, and the adjacent habitats in the Narrawang Wetlands and Haslams Creek are already subject to substantial light spill from Hill Road as well as the car park lighting in the subject site, and it is not clear what the impacts of an increase in light spill intensity will be. As identified in the National Light Pollution Guidelines for Wildlife prepared by the Department of the Environment and Energy (2020) a major limitation to understanding the impact of light on fauna is the lack of biological data with which to confidently interpret a model outcome. Therefore, it is not possible to objectively estimate how much artificial light is going to cause an impact on a particular species, or age class, over a given distance and under variable environmental conditions (Department of Environment and Energy 2020). Notwithstanding estimated impacts, the increase in light spill will only be for a relatively short time each day, and the majority of the night will not be disrupted by light spill, and therefore the impacts of the increase in light spill intensity is not likely to have a significant effect on native species.

A.4.1.2. Timing of Light Spill

Although the proposed modification will result in an increase in the intensity of light spill from the project, the time each day that these impacts will be felt is relatively short. As identified previously, the project is currently approved to operate from 6 am to 10 pm, seven days a week and 6 am to 12 am midnight for the Main Entry Building food and beverage areas on Fridays and Saturdays. For most of the operating hours of the wave park, it will be daylight and the issue of light spill into adjacent areas is not relevant. It is only during the hours of darkness that light spill from the project has potential to cause an ecological impact to nearby areas.

In winter in Sydney, the latest the sun rises is approximately 7 am and the earliest it sets is at approximately 5 pm (Time and Date AS 2021). Although this is when the sun rises and sets, it is usually still light before and after these times for at least one hour. This indicates that in winter the only time when light impacts are likely to be relevant are before 6 am and after 6 pm. The proposed modification will result in an opening time of 5 am, (instead of the currently approved 6 am) which means that in the mornings it will have some additional light impacts for approximately one hour until daylight (from 5 am to 6 am) during the shortest days of winter. In summer, the earliest the sun rises is approximately 5.30 am on the longest day of the year (Time and Date AS 2021), and as it is light for at least an hour prior to sunrise, no impacts are expected from the opening of the wave park one hour earlier at 5 am as it will be already light.

For the majority of the time (five days out of seven)no change is proposed to the approved lighting hours in the evening. However, the proposed extension to opening hours on the weekend from 10 pm to 12 am will result in approximately two hours of potential light spill impacts (from 10 pm to 12 am) for two days per week (a total of four hours per week). This is considered to be a relatively minor impact, and for almost every night, the light levels will be as they were prior to the project. Furthermore, the dining facilities at Sydney Olympic

Park are already approved to operate until 12 am on Friday and Saturday nights, and these also involve some light spill (nominal).

A.4.1.3. Lighting Summary

Although there will be an increase in the amount of light spill from the modified project as a result of the additional height of the light poles and the additional pole, the time period during which these impacts will be relevant are relatively short. As demonstrated above, additional potential light spill from the proposed modification will occur for approximately seven hours per week in the winter (due to opening one additional hour in the morning) and approximately four hours per week in the summer (due to the two additional hours of operation in the evening on the weekend).

Measures have been implemented to minimise the light spill as a result of the project. The proposed lights will comprise Sylvania Raptor LED sports lighting floodlights that will be directed downward and aimed at the basin and will be fitted with cut-off fixtures and back shields to limit spill light outside URBNSURF boundary (Northrop 2021b).

In the context of the already relatively high level of existing night light entering the Narrawang Wetlands and Haslams Creek, the additional light is not expected to cause a significant impact to the fauna species that utilize these areas. Although as identified previously, the amount of light spill caused by the modified project is an increase from the approved project; overall the potential light impacts will be for a relatively short time each day and the majority of the night will still remain at existing levels of lighting.

Taking into consideration the existing light levels and light spill into the Narrawang Wetlands, the minor increase in the hours of operation is not likely to adversely impact any fauna species utilizing this area or Haslams Creek. As there are currently already relatively high levels of continuous nighttime light exposure from streetlights, there is only likely to be a relatively short period each day where lighting from the project will exceed existing levels. Any species utilizing adjacent areas of habitat are already accustomed to significant light spill from street lights and the existing car park lighting, and a minor increase in the length of illumination is not expected to significantly impact these species.

A.4.2. Noise

The FFA submitted with the original EIS (Applied Ecology 2017), provided an assessment of noise impacts on fauna, based on the hours of operation being 6 am to 10 pm, seven days a week and 6am to 12am midnight for the Main Entry Building food and beverage areas on Fridays and Saturdays. As identified in the Noise Impact Assessment (Wood and Grieve Engineers 2017) and considered in the FFA (Applied Ecology 2017), the approved project will result in a wide array of noise from several sources including the following:

- Construction noise;
- Increased traffic noise associated with the project;
- Noise of patrons;
- Ambient music;

- Noise of waves; and
- Noise of the wave generator

These impacts were assessed for the approved development by Wood and Grieve Engineers (2017) who found that they would not cause a significant impact on the surrounding community and sensitive fauna located within the Narrawang Wetlands located north of Hill Road.

The modification proposal seeks to extend those hours by opening one hour earlier at 5 am rather than 6 am on all seven days per week of operation and an additional two hours of operation by closing the wave park at 12 am midnight, rather than 10 pm on Fridays and Saturdays. These changes have potential to result in increased impacts to fauna species and therefore the DPIE have requested an assessment of the impact to fauna of the increased hours of operation and associated increased noise. The areas most likely to be subject to impacts of noise are the Narrawang Wetlands, north of Hill Road and Haslams Creek to the south.

It is widely recognised that increased levels of noise in the environment have the potential to impact on fauna species. One major way through which noise can affect wildlife is by masking acoustic signals that animals rely on and, in doing so, hindering inter- and intraspecific communication among individuals (Berger-Tal et al. 2019). This has implications for reproduction if it interferes with mating calls, and may affect communication, distribution and foraging success.

This subject site and surrounding areas including the Narrawang Wetlands and Haslams Creek are already currently subject to substantial levels of noise due to traffic, heavy machinery, aircraft and an active recreational area (Sydney BMX Track) which is located approximately 50 m to the south-east of the subject site (Stantec 2021). Fauna are known to habituate to noise in their environment, and due to the current high levels of noise the fauna that utilise nearby areas are likely to be habituated to the already relatively high levels of noise in their environment.

As identified above, the approved project will result in additional noise as a result of the wave generator and patrons. However, the Noise Impact Assessment for the approved project (Wood & Grieve Engineers, 2017) used the most stringent noise limit (night-time criterion) as the noise target at the boundary for the nearest sensitive receivers and found that no significant impacts would be expected. As reported in the FFA, predicted maximum noise levels (44dB(A)) were within permissible limits (Applied Ecology 2017).

The modification proposes to increase the hours of operation by one hour per day in the morning by opening one hour earlier (5am), and by an additional two hours in the evening (10pm-12am midnight) on Fridays and Saturdays. Although this will increase the length of time that the noise from the project is present in the environment, it will not increase the level of noise. The Acoustic Report prepared for the modification (Stantec 2021) found that with all noise sources operating simultaneously, operational noise levels will be a maximum of 32 dB(A) at the nearest sensitive receiver, less than originally predicted for the approved project (44 dB(A)). This is due to changes in the current design relative to the one proposed at the time of the original SSD submission.

The time periods that additional noise impacts would be experienced are at either end of the day, early in the morning and late at night. Accordingly, not all of the potential noise sources are likely to be operating equally

and at the same time. During the early morning/late evening the crowd attendance would likely be significantly lower, which would result in lower noise levels (Stantec 2021). Similarly, at these times of the day there would likely be less traffic on the roads, thereby reducing the overall level of noise in the environment. As the predicted noise levels were calculated by simulating all noise sources operating simultaneously, the actual level of noise produced during the additional hours of operation in the morning and evening are likely to be less than those modelled.

Given that the approved project will result in 10 hours of noise impacts, the relatively minor additional impact of one hour per day in the early morning (7 hours per week), and two hours in the weekend evenings (four hours per week) when other noises are expected to be reduced is unlikely to increase the level of impact to native species substantially beyond the level already approved. Furthermore, there has been a reduction of 12 dB(A) in the proposed modification compared to the already approved project.

The fauna species that currently utilise the Narrawang Wetlands and Haslams Creek are already habituated to relatively high levels of noise in the environment and the additional noise impacts are an extension to existing noise impacts, and are not a stand-alone, additional noise source. If the additional opening hours were to be during a period where there was silence before and after, it would be expected to have a greater impact than as part of a long period of continuous noise. Being an extension to the continuum of noise that will be produced for an already approved 10 hours means that it is more likely that fauna will adapt to it than they would to a stand-alone, additional noise source. Accordingly, the relatively minor increase in noise impacts expected as a result of the proposed modification are not expected to result in a significant impact to fauna species.

A.5. Conclusion

The client is proposing a modification to an existing SSD application approval, for a proposed wave park to be constructed on the subject site at Sydney Olympic Park. The currently approved hours of operation are 6 am to 10 pm, seven days a week with the Café, restaurant, and alfresco bar in the Main Entry Building able to operate from 6am to 12am midnight on Fridays and Saturdays. The modification application seeks to amend the approved development by the following:

- Extend the morning operating hours by opening one (1) hour earlier at 5 am rather than 6 am seven days a week.
- An additional two (2) hours of operation for the wave park by closing at 12 am on Fridays and Saturdays.

This will result in a minor increase in the impacts of light and noise to areas of nearby biodiversity value and this Biodiversity Impact Statement has been prepared to provide an assessment of these impacts in response to a request from DPIE.

The amount of light spill will increase to some extent as a result of the modification as indicated by modelling conducted by Northrop (2021). However, the project itself will predominantly operate during the day, and light spill impacts will be limited to early in the morning and late at night. As the project will operate mainly during daylight hours when no impact of lighting will occur to nearby areas, only relatively few hours per week of lighting impacts will be experienced by nearby areas, from operation early in the morning and after sunset.

Although the amount of light spill at any one time likely to be caused by the modified project is an increase from the approved project; overall the potential light impacts are for a relatively short time each day and the majority of the night will still remain at existing levels of light spill. In the context of the relatively high level of existing night light entering the Narrawang Wetlands and Haslams Creek, the additional light is not expected to cause a significant impact to the fauna species that utilize these areas.

Noise modelling indicates that noise levels caused by the proposed modification will reduce in intensity from those proposed in the approved project, although due to the increase in operating hours, some increase in noise impacts may occur to adjacent areas. These areas are already subject to substantial levels of noise due to traffic, heavy machinery, aircraft and a BMX track. Fauna species are known to habituate to noise in their environment, and due to the current high levels of noise, the fauna that utilise the Narrawang Wetlands and Haslams Creek are likely to be habituated to the already relatively high levels of noise in their environment. Furthermore, the increase in operating hours will occur at the beginning of the day and the end of the day when other noise sources such as traffic and patrons are likely to reduced. The additional noise from the project will comprise an addition to existing noise impacts, and are not a stand-alone, additional noise source and therefore it is expected that fauna will habituate to the minor increase in noise. Therefore, the relatively minor increase in noise impacts as a result of the increased operating hours are not expected to result in a significant impact to fauna species.

The proposed amendment to the operating hours would bring the wave park in line with other aquatic facilities operating within Sydney Olympic Park. The modifications proposed will result in a development that is substantially the same as the approved development and the minor increases to noise and light impacts from the increased opening hours are not expected to result in a significant impact to the biodiversity values of adjacent areas or their ability to provide habitat for native fauna species.

A.6. References

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Time and Date AS. 2021. Sydney, New South Wales, Australia — Sunrise, Sunset, and Daylength, 2021.

FIGURES

Image Source:
Image © NearMap 2021
Dated: 31/5/2021

Coordinate System: MGA Zone 56 (GDA 94)

cumberland ecology

0 50 100 150 200 m

I:\...\21209\Figures\Letter 2\20210809\Figure 2. Aerial photography

Figure 2. Aerial photography covering the subject site