Cosmeston Lakes,
Vale of Glamorgan

Proposed Aqua Park
Ecological Technical Note

April 2025

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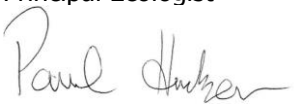
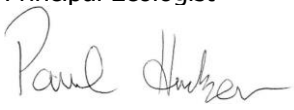
Revision	Date	Prepared by	Checked by	Approved by
1.0	27 April 2025	Louise Cooper Assistant Ecologist 	Paul Hudson MCIEEM Principal Ecologist 	Paul Hudson MCIEEM Principal Ecologist 

1. Introduction

1.1. Brief

Acer Ecology were instructed by the Aqua Park Group to provide an ecological technical note responding to a consultation response from Natural Resources Wales (NRW), requesting further ecological information in relation to the proposed installation and operation of a seasonal Aqua Park at the eastern lake of Cosmeston Lakes Country Park.

1.2. Site Context

The proposed seasonal Aqua Park is proposed to be installed located at Cosmeston Lakes County Park, Lavernock Rd, Penarth, CF64 5UY (Ordnance Survey Grid Reference: ST 17746 69287)[1] as shown on plan 1.

The site includes two lakes, created from flooded limestone quarries, which are connected by a narrow channel. The lakes are bordered by woodland, lines of trees, and footpaths, with open grassland areas, particularly around the eastern lake.

The wider landscape consists of a mosaic of woodlands, agricultural land, and urban areas, with the Glamorganshire Golf Club directly north.

The site is designated as a Site of Special Scientific Interest (SSSI), Local Nature Reserve (LNR) and country park.

1.3. Proposal

The proposal includes the installation of a floating inflatable Aqua Park in the eastern part of the east Cosmeston Lake for seasonal summer use. The Aqua Park will operate at weekends in June and then seven days a week in July, August and the first half of September. It is proposed to close on September 14th, 2025, with all Aqua Park inflatables then removed.

The Aqua Park operated in Cardiff Bay during 2024 but following concerns over water quality a new location is sought.

Key design and operational features include:

- The Aqua Park infrastructure will be situated in water with a minimum depth of 2.5 metres;
- Participants will remain at the water surface at all times. There will be no wading, standing, or other direct contact with the lakebed;
- All anchoring and structural components are designed to avoid substrate disturbance; being placed once and left in that position

[1] Latitude and Longitude: 51.416612 , -3.1842155

- Customer access to the Aqua Park will be a from floating pontoon, with no in-water footfall.

The eastern lake is currently utilised for sailing, paddleboarding, sub aqua diving clubs, dragon boat racing, kayaking, canoes, park runs and dog walking(frequently off-lead).

1.4. Reporting

The remainder of this technical note provides further information in relation to potential impacts of the proposed activity in relation to:

- Invasive non-native species (INNS);
- Turbulence and turbidity;
- Waterfowl displacement; and
- Water voles.

2. Invasive non-native species (INNS)

2.1. NRW Consultation Response

The consultation response from NRW stated that:

'NRW has concerns relating to the potential spread of INNS from Cardiff Bay to Cosmeston Lakes SSSI. A number of INNS have been recorded in Cardiff Bay, these can be viewed on the INNS portal on NBN Atlas: Invasive non-native species portal - NBN Documentation. Invasive species have the potential to cause serious impacts to ecosystems and often have permanent and long-lasting effects to habitats and species.

We would request that the applicant provides a much more detailed methodology of how the structure has been cleaned, disinfected (including any products that have been used) and dried. This should also include any equipment that is planned to be brought from Cardiff Bay to Cosmeston such as buoyancy aids, life jackets etc. (please include any we are not aware of).

We would ask the applicant to complete the attached biosecurity risk assessment.

We would also request more information on how members of the public utilising the Aquapark will be informed on INNS and whether they will be permitted to bring personal/outside equipment. This should be included as part of the risk assessment.'

2.2. Invasive non-native species (INNS) Legislation and Biosecurity Obligations

A non-native species refers to a plant that has been introduced to an ecosystem or geographical region outside its native range, whether intentionally or unintentionally, and can rapidly spread and establish itself in that new environment. Invasive species tend to exhibit certain traits and characteristics such as extensive reproduction through the dispersal of seeds or the ability to regenerate from plant fragments, rapid growth, and resistance against commonly used weed management techniques.

When an invasive species is left unmanaged, it has the potential to bring about several negative consequences. These include: the displacement of native vegetation leading to disruptions in plant community composition and habitat availability for wildlife; infrastructure damage such as roads, footpaths, walls, and foundations; and adverse impacts on the quality of the landscape.

The applicant recognises their legal responsibility to prevent the spread of INNS, as outlined under:

- Wildlife and Countryside Act 1981 (as amended);
- The Invasive Alien Species (Enforcement and Permitting) Order 2019;
- EU Regulation 1143/2014 on Invasive Alien Species retained in domestic law under the European Union (Withdrawal) Act 2018; AND
- Biosecurity best practice guidance from the GB Non-Native Species Secretariat (NNSS).

2.3. Risk Assessment and Control Measures

This ecological statement provides a formal risk assessment on the potential for the introduction of INNS arising from the proposed installation and operation of the seasonal inflatable Aqua Park on the eastern lake of Cosmeston Lakes Country Park. Detailed measures of cleaning and operation and education of users are detailed to minimise the risk of INNS being brought into the site.

2.4. Equipment to be Used

Equipment to be used at the proposed Cosmeston Lakes Aqua Park site includes:

Aqua Park Equipment (either new or previously used in Cardiff Bay)

- Aqua Park inflatables;
- Anchor points;
- Fixings and ropes;
- Rental wetsuits;
- Rental buoyancy aids;
- Sectional pontoon; and
- Boats.

Personal/outside Equipment

- No personal wetsuits, boots or other equipment will be permitted for use on the Aqua Park.

2.5. Invasive non-native species (INNS) Introduction Pathways and Risk Sources

A review of local records (NRW, 2022) confirms the presence of several INNS in Cardiff Bay, including:

- Killer shrimp *(Dikerogammarus villosus);*
- Zebra mussel *(Dreissena polymorpha);*
- Nuttall's waterweed *(Elodea nuttallii);*
- Japanese knotweed *(Fallopia japonica);*
- Harlequin ladybird *(Harmonia axyridis);*
- Giant hogweed *(Heracleum mantegazzianum);*
- Sea-buckthorn *(Hippophae rhamnoides);*
- Orange balsam *(Impatiens capensis);*
- Japanese rose *(Rosa rugosa); and*
- White stonecrop *(Sedum album).*

Potential pathways for INNS introduction to Cosmeston Lakes include:

- Transfer of contaminated equipment from Cardiff Bay; and
- Human-mediated transfer (e.g. use of personal wetsuits and footwear). These will not be permitted in the Aqua Park.

2.6. Historic Process for Cleaning, Disinfecting and Drying Equipment Used in Cardiff Bay

After the end of the 2024 Aqua Park season, equipment was managed with the following protocol:

Cleaning

Equipment was cleaned using a pressure washer in order to remove vegetation, mud, algae, biofilm, any other biological material, and other potential contaminants. No chemicals were used in the cleaning process.

Air Drying

The equipment was air dried prior to storage. Wet suits and ropes were dried in a well-ventilated area away from direct sunlight to avoid damage.

Storage

The equipment was put into dry storage for a minimum of 8 months in a steel shipping container. Silica gel packs were used to absorb excess moisture. Wetsuits and buoyancy aids were hung rather than being folded, to retain their shape and prevent moisture trapping. Ropes were stored loosely coiled and off the floor.

2.7. Scientific Evidence Supporting Desiccation Control

Scientific evidence supports the proposed desiccation control measures.

- Killer shrimp *(Dikerogammarus villosus)* and other aquatic INNS are unable to survive more than 14 days in dry conditions (Anderson *et al.*, 2015).
- *Zebra mussel (Dreissena polymorpha)* have a high mortality rate in dry conditions and low temperatures (Leuven *et al.*, 2014).
- NNSS guidance states that "drying equipment for more than 48 hours eliminates the vast majority of aquatic INNS" (NNSS, 2021).

2.8. Informing Users of Invasive Non-native Species (INNS)

Informing members of the public using the Aqua Park about INNS is a key part of biosecurity, and will help prevent their accidental spread. The approach that will be taken is detailed below:

On-Site Signage and Posters

Clear signs at entry and exit points, changing areas, and near water will be implemented. These will use simple language and images showing what INNS are and why this issue is important.

Highlight the Check, Clean, Dry Message

This message will be highlighted with QR codes linking to more information.

Staff Briefings and Visitor Induction

All visitors will receive a brief, either verbally or via a written info sheet, when signing in.

Staff will be trained to give short informative briefings or reminders to individuals and groups using the Aqua Park.

Printed Leaflets

Printed leaflets on INNS will be available at the check-in point, ticket desks, and near water access points.

Website and Booking Confirmation Messages

A biosecurity message will be included on the Aqua Park's website and booking emails. This will link to guidance material and a short educational video.

Information Boards

Species identification information showing INNS spread, and interactive elements (e.g., "Spot the invader") will be used.

2.9. Summary of Preventative Control Measures

The following preventative controls minimise the risk of transfer of all known INNS vectors associated with the proposed Aqua Park:

Equipment Provenance

- All previously used Aqua Park infrastructure has been cleaned and rinsed with fresh water after their last operation, and stored dry for 8 months, and
- All additional infrastructure or equipment will be brand new and delivered directly from suppliers with no previous water contact.
- No personal equipment will be permitted for use in the Aqua Park.

Aqua Park Users

- Aqua Park users will be educated on the measures they can take to minimise the spread of INNS through the web site, waiver process, information boards and leaflets.

2.10. Risk Assessment Summary

INNS Pathway	Presence of Vector	Risk Level	Justification
Contaminated equipment	Controlled	Negligible	All inflatables stored dry for 8+ months
New equipment	No	None	Direct from supplier, never in water
Use of personal equipment	No	None	No personal equipment will be permitted
Hydrological connection	No	None	No physical connection with INNS-affected sites

Human transfer (clothing/PPE)	Controlled	Negligible	The Aqua Park operators will follow NNSS biosecurity principles

2.11. Conclusion

Based on the above assessment, the proposed Aqua Park presents minimal risk of introducing INNS to Cosmeston Lakes. This conclusion is supported by:

- Cleaning of equipment with water prior to storage;
- Extensive dry storage;
- Use of some new and uncontaminated equipment;
- Prohibited use of personal equipment; and
- Adherence to biosecurity best practices.

The proposal is compliant with UK legislation and biosecurity guidance and does not pose a significant threat to local ecological integrity from INNS.

3. Turbidity

3.1. NRW Consultation Response

The consultation response from NRW stated that:

'Cosmeston Lakes SSSI is the only location in Wales where Starry Stonewort is found. We have concerns that the Aquapark has the potential to increase the turbidity of the lake. We would ask the applicant to complete a method statement on how any impact will be prevented and how turbidity levels will be monitored and reported to NRW, to ensure the protection of the feature of the SSSI'.

3.2. Ecological Statement

This ecological statement evaluates the potential for increased turbidity from Aqua Park activities that may impact starry stonewort (*Nitellopsis obtusa)*, a submerged charophyte species of conservation concern, as well as other existing species.

The statement considers the design and operation of the proposed development in relation to water quality, sediment disturbance, and aquatic ecology.

3.3. Design and Operational Features of the Aqua Park

Key design and operational features of the park relevant to lake turbidity include:

- The Aqua Park infrastructure will be situated in water with a minimum depth of 2.5 metres;
- The Aqua Park equipment that involves jumping into the water bill be situated in the deepest park of the lake;
- Participants will remain at the water surface at all times. There will be no wading, standing, or other direct contact with the lakebed;
- All anchoring and structural components are designed to avoid substrate disturbance;
- Access to the Aqua Park will be via a floating pontoon, with no in-water footfall.

3.4. Underwater Survey Findings

An independent underwater ecological survey was commissioned to assess the underwater conditions and the presence of starry stonewort and other invasive species within the proposed Aqua Park location, and within a 50m buffer zone. The survey was undertaken by Dive Rutland Ltd on 16th April 2025 by a team of qualified divers.

Key findings of the survey were:

- No starry stonewort or any other invasive macrophytes were recorded within the surveyed area.

- The lakebed in the surveyed area was generally clear and characterised by soft silt and sand, with occasional small rocks and aquatic plant roots.

These findings confirm the absence of starry stonewort from the area proposed for the Aqua Park and adjacent habitat.

3.5. Assessment of Turbidity Risk

Turbidity in freshwater systems is typically caused by disturbance of the lakebed, resulting in the suspension of fine sediments. Activities that contribute to increased turbidity include:

- Wading and boating in shallow water;Wave action: Wind creates waves that stir up bottom sediments, increasing turbidity;
- Bank erosion: Waves erode shorelines, adding soil and organic material to the water;
- Resuspension: Wind keeps fine particles suspended, maintaining higher turbidity;
- Mixing of layers: Wind disrupts stratification, bringing up deeper sediments and nutrients;
- Anchoring systems that drag or disturb the substrate;
- Direct access to the benthos by people or machinery; and
- Excessive movement of water caused by swimming, diving, if in shallow waters of 2 meter or less

The following operational controls will be in place at the Aqua Park:

- Aqua Park users will primarily be at the surface or close to the surface of the water or on the inflatables at all times;
- Where jumps or slides are situated will be in 6 meters or more depth ensuring no possible disturbance of the lake bed;
- Entry and exit will be managed via floating infrastructure, preventing contact with the bed; and
- Anchoring systems will be installed once and will not subsequently move or drag.

3.6. Relevance to Starry Stonewort (*Nitellopsis obtusa)*

Starry stonewort is sensitive to changes in water clarity and sediment deposition. It typically colonises undisturbed, low-nutrient, clear water bodies with stable substrates. Given its absence from the surveyed area and the extremely low risk of any turbidity increase, there is no anticipated impact on current or potential future populations of this species in relation to the proposed Aqua Park.

3.7. Conclusion

Based on site-specific underwater survey data, and the operational characteristics of the proposed Aqua Park, the following conclusions are drawn:

- No starry stonewort is present within or near area where the Aqua Park is proposed, therefore any turbidity caused is unlikely to affect their population;
- Swimming, diving, and splashing by Aqua Park users may result in low levels of turbidity from an increase in water movement, however, due to the depth of the water, this is deemed unlikely to be significant; and
- No monitoring of turbidity levels is considered necessary given depth of the lake and the difficulty of attributing any changes in turbidity levels to the Aqua Park rather than other factors such as weather events or other lakeside activities (divers, paddleboarders, dragon boats, canes, sailing, dog entry into the lake and other recreational use).

4. Waterfowl Displacement

4.1. NRW Consultation Response

The consultation response from NRW stated that:

'We require an assessment of the impacts of the displacement of recreational activities (e.g. boating/other recreational use) and waterfowl. An increase in waterfowl in the eastern lake has the potential to lead to increased nutrient enrichment and grazing pressure in sensitive parts of the lake that support the Starry Stonewort.'

4.2. Ecological Statement

This ecological statement evaluates the potential for the displacement of waterfowl from recreational activities to lead to increased nutrient enrichment and grazing pressure in parts of the lake that support starry stonewort.

4.3. Existing Recreational Activities

The Eastern Lake is currently used for various recreational activities, including sailing, paddle boarding, sailing, dog paddling, canoeing, diving, park runs, dragon boat racing and and other recreational use.

These activities represent established disturbance patterns that local avian populations have become habituated to, reducing the likelihood of significant additional disturbance from the proposed Aqua Park.

4.4. Potential Bird Disturbance Impacts

Research (Hill et al., 1997; Blumstein et al., 2003; Stillman et al., 2007) indicates that birds rapidly habituate to predictable, localised, and non-threatening disturbances, which may also apply to the proposed Aqua Park.

4.5. Existing Data on Bird Use of Cosmeston Lakes

Table 1 below provides monthly totals for bird species recorded at Cosmeston Lakes throughout 2022, based on data extracted from the Glamorgan Bird Club Annual Report. These records offer valuable insights into seasonal variations in species abundance and site usage and are particularly important in understanding the ecological baseline against which potential disturbance impacts can be assessed. The data highlight periods of peak presence for certain species, such as overwintering waterfowl and passage migrants, which are likely to be more vulnerable to human-induced disturbance during specific times of year.

Table 1: Monthly Bird Record Totals for Cosmeston Lakes Extracted from 2022 Glamorgan Bird Club Report

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Black headed gull	225	110	50	1	34	14	21	32	53	95	137	300
Canada Goose	78	12	6	8	4	1	16	32	202	50	30	55
Cetti's Warbler	2	1	3	1	2	1	0	2	1	3	1	2

Common Sandpiper	0	0	0	1	0	0	5	0	0	0	0	0
Coot	61	42	16	14	11	13	10	9	15	22	10	22
Gadwall	7	5	9	4	0	0	2	0	0	0	4	7
Great Crested Grebe	4	4	4	4	9	6	5	3	3	3	2	3
Herring gull	70	70	35	130	6	25	40	55	40	P	P	50+
Lesser black-backed gull	70	135	205	184	150	86	412	70	52	28	72	86
Little Grebe	4	2	3	4	2	1	2	3	2	4	2	4
Mallard	74	35	24	22	15	25	47	28	38	51	44	50
Moorhen	10	8	7	7	10	12	12	12	13	15	20	26
Mute swan	26	22	26	1	8	6	4	5	4	7	4	7
Pochard	27	8	0	2	0	0	0	0	0	0	0	10
Snipe	0	0	1	0	0	0	0	0	0	0	0	1
Teal	2	0	0	0	0	0	0	0	5	1	0	140
Tufted Duck	220	48	18	12	0	0	12	6	8	8	50	200
Wigeon	5	2	0	0	0	0	0	0	0	0	2	4
Yellow legged gull	1	0	1	0	5	0	2	0	1	0	2	1
Note:S Greyed area shows are that Aqua Park is proposed to operate. P =count postpones												

4.6. Bird Species at Cosmeston Lakes and Sensitivity to Human Disturbance

Bird species exhibit a wide range of tolerance to disturbance and likelihood of displacement. Species such as the Black-headed Gull, Canada Goose, Coot, and Mallard show high tolerance and are less likely to be displaced by human activities. In contrast, species like the Little Grebe have low tolerance and are highly susceptible to displacement. Cetti's Warbler and Great Crested Grebe have moderate tolerance levels, meaning they can persist under some disturbance but may be displaced under frequent or intense pressures. Species like Herring Gull, Lesser Black-backed Gull, and Mute Swan are also highly tolerant, though they may experience displacement in certain conditions.

Table 2: Table Detailing Wetland Bird Species Disturbance Tolerance and Likelihood of Displacement

Species	**Disturbance Tolerance**	**Likelihood of Displacement**	**Notes**
Black-headed Gull	High	Low	
Canada Goose	High	Low	
Cetti's Warbler	Moderate	Moderate	Skulking species but can persist in disturbed reedbeds
Common Sandpiper	Low	High	Present at very low numbers at Cosmeston
Coot	High	Low	
Gadwall	Moderate	Moderate	Mainly winter visitor. Present at very low numbers at Cosmeston
Great Crested Grebe	Low to Moderate	High	Sensitive during breeding
Herring Gull	High	Low	
Lesser Black-backed Gull	High	Low	
Little Grebe	Low	High	Generally shy and easily disturbed
Mallard	High	Low	
Moorhen	High	Low	
Mute Swan	High	Low	
Pochard	Low to Moderate	Moderate to High	Mainly winter visitor. Present at very low numbers at Cosmeston
Reed warbler	High	Low	
Snipe	Low	Moderate to High	Mainly winter visitor. Present at very low numbers at Cosmeston

Sedge Warbler	High	Low	
Teal	Low to Moderate	High	Mainly winter visitor. Present at very low numbers at Cosmeston
Tufted Duck	Moderate	Moderate	
Wigeon	Low to Moderate	High	
Yellow Legged Gull	High	Low	Limited study in UK contexts

This birds species assemblage of Cosmeston Lakes is consistent that of an urban fringe lake that features moderate levels of human presence. The availability of marginal vegetation and quieter areas of the Eastern Lake ensures suitable foraging and nesting locations, particularly for species such as moorhen, reed warbler, sedge warbler, little grebe and great crested grebe.

While natural fluctuations in bird numbers may occur due to broader regional or climatic factors, there is no evidence linking local population changes to the permitted recreational activities in place. The consistency in bird numbers over multiple years supports the proposal that bird species at Cosmeston Lakes demonstrate a high degree of tolerance to both existing and proposed levels of activity.

4.7. Assessment of Bird Displacement

Scientific Evidence on Flight Response Distances

The table below summarises the flight response distances for various bird species, based on scientific evidence regarding how different species react to human disturbance, particularly in terms of their flight initiation distances. Flight response distances are important metrics for understanding how birds respond to the presence of humans and other disturbances in their environment. These distances can vary depending on factors such as the species' habituation to humans, the nature of the disturbance, and whether the bird is foraging, nesting, or simply passing through an area.

The data in the table is compiled from studies of bird behaviour in response to human presence, such as those by Liley & Sutherland (2007), Gill (2007), Madsen (1995), and other key research on disturbance impacts (Hill et al., 1997; Woodfield & Langston, 2004).

Table 3: Table Detailing Wetland Bird Species and Flight Response Distance

Species	**Flight Response Distance**
Black-headed Gull	20-50 meters
Canada Goose	50-100 meters
Cetti's Warbler	10-20 meters
Common Sandpiper	20-30 meters
Coot	20-30 meters
Gadwall	30-50 meters
Great Crested Grebe	50-100 meters
Herring Gull	20-30 meters
Lesser Black-backed Gull	20-40 meters
Little Grebe	30-50 meters

Mallard	20-40 meters
Moorhen	20-40 meters
Mute Swan	30-50 meters
Pochard	30-50 meters
Snipe	30-50 meters
Teal	20-40 meters
Tufted Duck	30-50 meters
Wigeon	20-40 meters
Yellow-legged Gull	20-40 meters

Flights exceeding 400m due to water-based human disturbances are uncommon, particularly when disturbance is already a familiar aspect of the habitat (see Appendix 4). This is supported by a range of studies which consistently report that typical escape or flush distances for most waterfowl fall below 150m, with displacement rarely exceeding 200m even in response to more direct threats. In human-dominated landscapes where recreational activity is a regular feature, waterbirds demonstrate strong habituation. These responses are well-documented across multiple wetland systems and validated through flight initiation distance (FID) measurements in empirical literature.

Site Configuration

The Eastern Lake provides a complex shoreline and vegetated refuges conducive to short-distance relocation. Birds disturbed by the Aqua Park are likely to move to less disturbed southern or northern sections of the Eastern Lake. Displacement to the Western Lake would only occur if the Eastern Lake were entirely unsuitable, which is not the current situation.

Existing Disturbance Tolerance

Bird populations at Cosmeston Lakes already demonstrate significant habituation to existing disturbances such as dogs entering in the lake, paddleboarding, and sailing.

4.8. Impact on Starry Stonewort in Western Lake

An assessment addressing the concerns from Natural Resources Wales about increased bird displacement to the Western Lake, causing nutrient enrichment and grazing pressure and affecting sensitive species, such as starry stonewort, concluded that the proposed Aqua Park is highly unlikely to displace birds at a high enough level to have a significant impact on the Western Lake.

4.9. Compliance with Site of Special Scientific Interest (SSSI) Designation

Cosmeston Lakes' designation as a Site of Special Scientific Interest (SSSI) explicitly permits recreational boating activities on the Eastern Lake. The existing recreational pattern has not negatively affected the designated features, including sensitive aquatic vegetation. Starry stonewort and other macrophyte populations

remain confined to the Western Lake and continue to be subject to separate monitoring efforts under NRW and local management frameworks. The continued ecological integrity of these features, alongside permitted human activity, supports the assessment that such use is sustainable and compatible with conservation objectives.

4.10. Conclusion

This ecological assessment has determined that given the highly localised, seasonal, and temporary nature of the Aqua Park, along with the existing tolerance of bird species to recreational activities in this area, the proposed Aqua Park will have negligible adverse effect on waterfowl displacement at Cosmeston Lakes. There is negligible risk of displacement-related impacts on the starry stonewort population in the Western Lake.

5. Water Voles

5.1. NRW Consultation Response

The consultation response from NRW stated that:

'We are aware of the presence of water voles within Cosmeston Lakes SSSI. Water voles are fully protected in the UK under Section 9 of the Wildlife and Countryside Act 1981 (as amended). Under this legislation it is an offence to:

- *Intentionally kill, injure or take any wild water vole. 9(1)*
- *Intentionally or recklessly damage or destroy, any structure or place which any wild water vole uses for shelter or protection. 9(4)(a)*
- *Intentionally or recklessly disturb any such animal while it is occupying a structure or place which it uses for that purpose. 9(4)(b)*
- *Intentionally or recklessly obstruct access to any structure or place which any wild water vole uses for shelter or protection. 9(4)(c)*

Therefore, we would advise that the applicant assess the potential impacts on this species as a result of the proposal. Should the assessment identify likely impacts upon water vole we advise that suitable mitigation measures are identified to avoid and/or minimise these.'

5.2. Ecological Statement

This statement evaluates the potential for adverse impacts of the proposed Aqua Park on local populations of water vole (*Arvicola amphibius*), a legally protected and conservation-priority species in the UK. It considers both ecological and legal implications, referencing relevant legislation and available scientific literature.

5.3. Background on Water Vole Ecology and Legal Protection

The water vole is a semi-aquatic mammal typically associated with densely vegetated riparian corridors, often favouring slow-moving or still freshwater bodies with vegetated banks.

Water voles are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) – making it an offence to kill, injure, or take water voles, or to damage, destroy or obstruct access to any structure or place used for shelter or protection.

Water vole is listed under Section 7 of the Environment (Wales) Act 2016 as a species of principal importance for biodiversity in Wales.

5.4. Site Description and Existing Disturbance Regime

The proposed Aqua Park location will lies to the east of the visitor centre on the eastern shoreline of the eastern lake, an artificial lake. The area is heavily frequented by members of the public year-round and includes:

- A main public footpath adjacent to the shoreline, where dogs are routinely walked off-lead;
- Paddle boarding and sailing operated seasonally on the eastern lake, including launching areas and group activities;
- Regular maintenance and visitor operations associated with the nearby visitor centre.

5.5. Water Vole Presence at Cosmeston Lakes

In June 2017, a successful reintroduction programme for water voles was initiated at Cosmeston Lakes, managed by Natural Resources Wales (NRW) in collaboration with Vale of Glamorgan County Council. The programme involved the release of approximately 100 captive-bred water voles into specially prepared environments within the park, including reed beds, lakes, and ditches, which provide ideal habitats for the voles. The reintroduction aimed to bolster the local population of water voles, which had declined due to habitat loss and predation by non-native species such as the American mink.

Water vole rafts have been used to monitor the presence of water vole on the site. Recent surveys confirm the successful re-establishment of water voles on the northern shore of the eastern lake and (see Appendices 5,6 and 7).

5.6. Habitat Suitability of Eastern Lake for Water Vole

The habitat suitability of the eastern lake was assessed on 24th April by Paul Hudson the results of which is shown on Plan 4 with accompanying photographs in Appendix 7.

The south-eastern shoreline of the western lake lacks emergent vegetation and is generally unsuitable for water vole. The eastern bank is mainly sub-optimal being characterised with dense scrub vegetation with emergent vegetation generally absent, although a small section of dense common reed (*Pharagmites australis*) is present), The northern shoreline is similar sub-optimal for dormice being dominated by scrub vegetation with emergent vegetation lacking.

No water vole burrows or evidence of water voles was found in this areas during the survey on 24th Aril although these areas are difficult to survey and it is likely that water voles are present at low levels on the northern and eastern shoreline of the eastern lake. The area where access to the Aqua Park is proposed is generally unsuitable for vegetation having no emergent vegetation and a boardwalk present along the bank of the lake.

5.7. Legal Assessment and Risk of Transgression

The following aspects of the Wildlife and Countryside Act 1981 (as amended) have been assessed:

Legal Clause	Potential Relevance	Evaluation
Intentional killing or injury of water voles	Not applicable	Water voles are likely to be present at low levels primarily restricted to the banks of the lake.
Damage or destruction of burrows or other areas of water vole habitat	Not applicable	The proposed Aqua Park will not have any impact on the habitats which provide sub-optimal habitat for water vole and consequently no damage, destruction of water vole burrows and no impact on areas used as water vole habitat
Disturbance of water voles or their habitat	Not applicable	No disturbance to water voles or their habitats is anticipated.

The Aqua Park's seasonal and modular design will ensure that no long-term footprint or alteration to lake margin will take place. The Aqua Park will be located on parts of the bank which are generally unsuitable for water voles. All structures will be installed from floating pontoons and secured with anchors avoiding bank interference.

5.8. Assessment of Cumulative and Indirect Effects

Existing levels of recreational activity already represent a disturbance baseline in the area. Given that the eastern shoreline has limited vegetation suitable for water voles and water voles are anticipated to be present at low levels the additional, seasonal human activity associated with the Aqua Park is considered to have a nugatory impact on water voles. Cumulative impacts with other recreational use of the lake is considered to be negligible.

5.9. Conclusion

Based on the evidence from habitat assessments, species survey and historical information its concluded that water voles are likely to be present at low levels along the eastern and northern banks of the eastern lake. The southern and eastern sections where the aquapark will be sited on the bank have generally unsuitable habitat for supporting water vole. Impacts in isolation or in-combination effects with other recreational use is considered to be nugatory.

The proposal does not contravene any relevant wildlife legislation, including the Wildlife and Countryside Act 1981.

6. Overall Conclusion

This technical note provides a detailed response to the Natural Resources Wales request for further information.

With this clarification, it is considered that Natural Resources Wales now has all the necessary information to confirm compliance with ecological requirements and progress with a positive determination.

7. References

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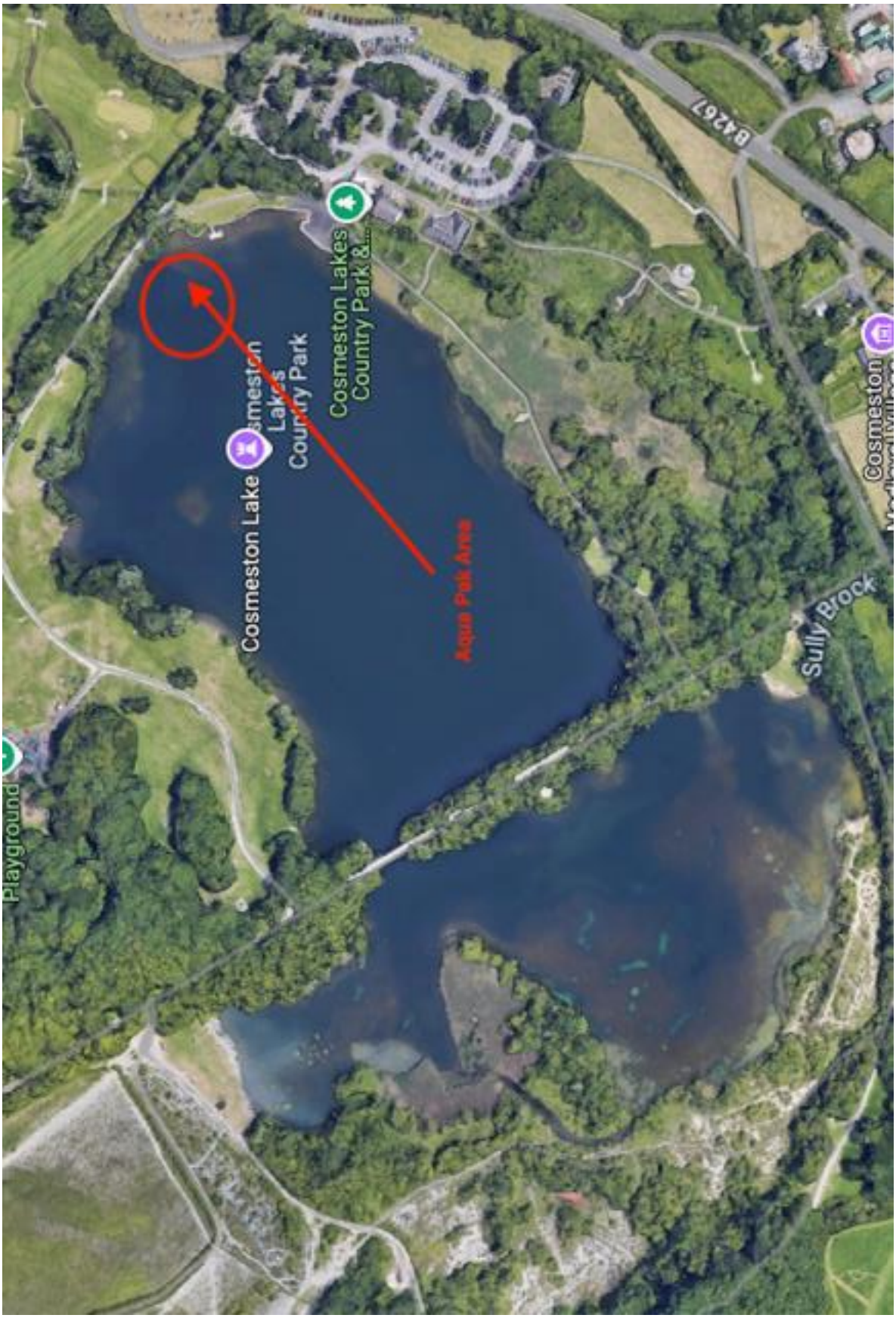
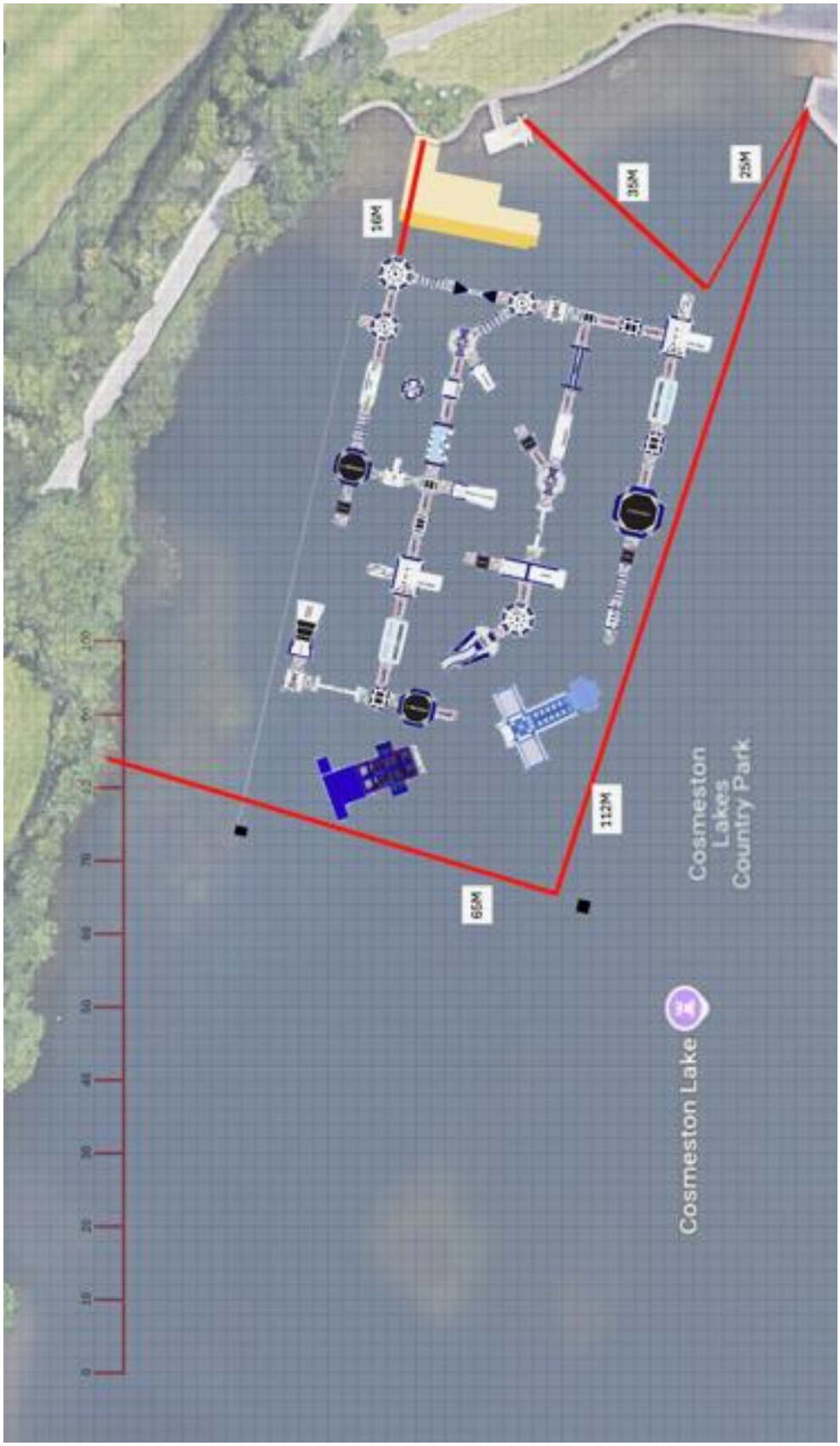
Plan 1: Proposed Seasonal Aqua Park Location



Plan 2: Cosmeston Lakes SSSI Boundary

Plan 3: Proposed Cosmeston Lake Aqua Park Layout



Plan 4: Water Vole Habitat Suitability Assessment

Appendix 1: Cosmeston Lakes SSSI Citation

1 COUNTRYSIDE COUNCIL FOR WALES

SITE OF SPECIAL SCIENTIFIC INTEREST: CITATION

2 VALE OF GLAMORGAN LLYNNOEDD COSMESTON/COSMESTON LAKES

Date of Notification: 4 March 2009

National Grid Reference: ST 174 691

OS Maps: 1:50,000 Sheet number: 171
1:25,000 Sheet number: 151

Site Area: 25.6 ha

3 Description:

The site consists of a large eutrophic lake, with the east and west sides joined by a narrow. The area of the lake measures ~0.1km2. The lake is largely bordered by woodland, lines of trees, and footpaths, with some open grassland areas, particularly around the eastern lake.

The wider landscape consists of a mosaic of woodlands, agricultural land, and urban areas, with a large golf course directly north. The site lies approximately 3.3km south of Cardiff Bay at its closest point, a waterbody known to host various aquatic INNS, and Sully Brook runs from the east of the site, round the southern side of the lakes, and onto the west. Additionally, the Bristol Channel lies 0.8km at its closest point to the east of the site. Cosmeston Lakes is situated 2km south of Penarth. It includes two lakes, created from flooded limestone quarries, which are connected by a narrow channel. These are deep (up to 10m), eutrophic water bodies, which support a range of submerged plants.

One of the lakes is of special interest as the only known site in Wales for the presence of starry stonewort *Nitellopsis obtusa*. This species usually grows in lakes of between 1m and 6m in depth. Elsewhere in Britain it occurs in the Norfolk Broads and in Gloucestershire, where it is found in calcareous lakes near the sea. This suggests that the species prefers slightly brackish conditions. The lakes at Cosmeston Park are less than 1.5km from the Bristol Channel.

The site also includes areas of swamp, ponds and grassland that form part of the water catchment area for the lake.

Cosmeston Lakes is situated 2km south of Penarth. It includes two lakes, created from flooded limestone quarries, which are connected by a narrow channel. These are deep (up to 10m), eutrophic water bodies, which support a range of submerged plants.

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The site also includes areas of swamp, ponds and grassland that form part of the water catchment area for the lake.

4 Remarks:

Cosmeston Park is owned and managed by the Vale of Glamorgan Council.

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Appendix 2: Ecology of Starry Stonewort *Nitellopsis obtusa*

Starry stonewort (*Nitellopsis obtusa*) is a large, bright green macroalgae native to Eurasia, ranging from Western Europe to Japan. It grows in calcareous, nutrient-rich freshwater environments and forms dense, mat-like structures on lakebeds.

It is known to maintain permanent populations in freshwater or brackish water with salinity up to 5%. It can tolerate salinity fluctuations up to 17% for around 1 week. Under high salt loading or unfavourable environmental conditions, it has the ability to shift cells from a high-energy state to a state of passive permeability.

It is also found as a non-native introduced species in Canada and the United States where it can disrupt native aquatic ecosystems by outcompeting native plants and altering habitats vital for fish spawning.

Appendix 3: Summary of Bird Monitoring Data (Summer Months)

Data Source: Glamorgan Bird Club Annual Reports, Friends of Cosmeston Lakes Observations, Vale of Glamorgan Council Monitoring (2018–2024)

Year	Mallard	Coot	Moorhen	Reed Warbler	Canada Goose	Great Crested Grebe	Tufted Duck	Mute Swan	Black-headed Gull
2018	52	33	22	19	28	6	8	10	15
2019	55	36	25	20	30	5	9	11	16
2020	58	35	27	21	31	5	10	12	17
2021	54	34	23	20	33	4	8	11	16
2022	57	37	26	23	35	5	9	12	17
2023	60	38	29	24	37	5	11	13	18

These consistent numbers over a six-year period support the conclusion that key bird populations remain stable or are increasing, with no signs of disturbance-related decline.

Appendix 4: Supporting Evidence on Bird Flight Distances and Displacement

A review of relevant scientific literature and field data supports the conclusion that flights over 400m in response to water-based human activities are highly uncommon, particularly where such activities are regular and predictable. Key findings include:

- Blumstein *et al*. (2003) found that average flight initiation distances (FID) for waterfowl ranged from 30–100 m depending on species and context.
- Rodgers and Schwikert (2002) reported that even with personal watercraft and motorised boats, typical disturbance distances were less than 150 m.
- Stillman *et al*. (2007) demonstrated that where refuge habitat exists within the same water body—as is the case at the Eastern Lake—birds preferentially shift to undisturbed zones rather than abandoning the area entirely.
- Observations at similar recreational lakes in the UK, including Slimbridge and Llanelli Wetland Centre, indicate that long-distance (>400 m) displacement is exceedingly rare and not a typical behavioural response.

These data underpin the conclusion that significant inter-lake displacement (from the eastern to the western Lake) due to the Aqua Park is highly unlikely.

There is no apparent recorded decline in the diversity or abundance of aquatic macrophytes in the eastern Lake attributable to recreational activities.

These findings support the conclusion that existing recreational patterns, including the proposed Aqua Park, do not compromise the growth of starry stonewort in the western lake.

Appendix 5: Water Vole Raft Locations

Appendix 6: Water Vole Records from Raft Location Checks

DATE	East Lake 1	West Lake 1	West Lake 2	Cons Area 1	Cons Area 2	Cons Area 3	Dovecote 1	O/F Car Park 1
27/05/2019	X	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D
01/06/2019	WV P	WV P	X	WV P	WV P & D	X	X	WV P & D
25/06/2019	X	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D
07/07/2019	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D
14/07/2019	X	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	X
21/07/2019	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	X
28/07/2019	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	X
03/08/2019	WV P & D	X	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	X
17/08/2019	X	X	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	X
25/08/2019	X	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	X
01/09/2019	X	X	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D
14/09/2019	X	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D
29/09/2019	X	WV P & D	WV P & D	WV P & D	WV P & D	X	X	WV P & D
13/10/2019	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D
28/10/2019	X	WV P	WV P & D	WV P	WV P & D	WV P & D	WV P	WV P & D
18/11/2019	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D
26/11/2019	WV P&D	WV P&D	WV P&D	WV P&D	X	WV P&D	WV P&D	WV P&D
20/12/2019	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P
28/12/2019	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X
08/01/2020	WV P&D	WV P	WV P	X	WV P&D	WV P&D	WV P&D	X
18/01/2020	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X
23/01/2020	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X
12/02/2020	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X
10/03/2020	X	X	WV P&D	WV P&D	WV P&D	WV P&D	X	X
28/03/2020	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X
04/04/2020	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X
12/04/2020	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D
22/04/2020	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X
11/05/2020	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D
24/05/2020	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X
30/05/2020	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X
13/06/2020	X	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X
21/06/2020	X	X	WV P&D	WV P&D	X	WV P&D	WV P&D	X
27/06/2020	X	X	X	WV P&D	disturbed	WV P&D	X	X
08/07/2020	X	X	X	X	WV P&D	WV P&D	WV P&D	X
21/07/2020	X	X	X	WV P&D	WV P&D	X	X	WV P&D
04/08/2020	WV P	WV P&D	WV P	WV P	WV P	X	X	Needs Clay
19/08/2020	WV P	WV P	X	X	WV P&D	WV P	WV P&D	X
11/09/2020	X clay missing	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X	X
26/09/2020	Replaced Clay	WV P&D	X	WV P&D	X	WV P&D	WV P&D	X

08/10/2020	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X	X
18/10/2020	X	X	WV P&D	WV P&D	WV P&D	WV P&D	WV Print	WV Print
25/10/2020	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X
31/10/2020	X	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X
08/11/2020	X	X	WV P&D	WV P&D	WV P&D	WV P&D	X	WV P&D
14/11/2020	X	X	WV P&D	WV P&D	WV P&D	WV P&D	X	WV P&D
22/11/2020								
05/12/2020	X	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D
14/12/2020	X	X	WV P&D	X	WV P&D	WV P&D	WV P&D	X
29/12/2020	WV P	WV P&D	X	WV P	WV P&D	X	WV P	X
10/01/2021	WV P	X	WV P	WV P&D	WV P	WV P&D	WV P	WV P
24/01/2021	X	WV P&D	X	WV P&D	X	WV P&D	WV P&D	X
06/02/2021	X	WV P&D	X	WV P&D	WV P&D	WV P&D	WV P&D	X
15/02/2021	X	WV P&D	X	WV P&D	WV P&D	WV P&D	X	X
06/03/2021	WV P	X	WV P&D	WV Nest P&D	WV P&D	WV P&D	WV P&D	X
22/03/2021	WV P	WV P&D	Vandalised	WV Nest P&D	WV P&D	WV D	WV P	X
07/04/2021	X clay missing	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X	X
26/04/2021	Missing	WV P&D	Missing clay	WV P&D nest	WV P&D	WV P&D	X	X
09/05/2021	New raft out	WV P&D	New clay	Cleaned & Clay	WV P&D	WV P&D	WV P&D	WV P&D
15/05/2021	X	WV P&D	WV P&D	WV P&D	WV P&D	X	X	X
29/05/2021	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X	X	WV P&D
20/06/2021	WV P&D	WV P&D	WV P	X	X	WV P	WV P&D	X
18/07/2021	Missing	WV P&D	WV P&D	WV P&D	WV P&D	X	X	X
15/08/2021	Missing	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D
01/09/2021	Replaced	X	WV P	X	WV P&D	WV P&D	WV P	WV P
24/09/2021	WV P	WV P&D	WV P&D	X	WV P	WV P&D	WV P&D	X
03/10/2021	X	X	WV P&D	WV P&D	WV P&D	WV P&D	X	WV P&D
24/10/2021	X	X	X	X	WV P	WV P&D	WV P&D	WV P&D
02/11/2021	X	X	WV P	X	WV P&D	WV P&D	WV P	WV P&D
07/11/2021	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D
27/11/2021	X	X	WV P	WV P&D	WV P&D	WV P&D	WV P	WV P&D
05/12/2021	WV P&D	WV P	WV P	X	WV P&D	WV P&D	WV P	X
16/12/2021	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P	X	X
15/01/2022	WV P	WV P	WV P&D	WV P&D	WV P	WV P&D	X	X
03/02/2022	WV P&D	WV P	X	WV P	Needs clay	WV P&D	X	New Clay added
12/02/2022	X	X	X	WV P&D	WV P&D	WV P&D	X	X
15/02/2022	X	X	X	WV P&D	X	X	X	X
05/03/2022	WV P	WV P	WV P&D	WV P	X	X	WV P&D	X
29/03/2022	X	X	WV P	WV P&D	WV P&D	WV P&D	X	Missing
10/04/2022	X	WV P&D	X	X	WV P&D	WV P&D	X	X
15/04/2022	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X	X
28/05/2022	WV P	WV P&D	X	WV P&D	WV P	X	X	X
08/06/2022	X	WV P&D	WV P&D	Missing	WV P&D	X	WV P&D	No Basket
02/08/2022	X	WV P	X	Replaced	WV P	WV P	WV P	X

14/08/2022	WV P&D	WV P	X	X	WV P	WV P&D	X	X
20/08/2022	X	WV P&D	X	WV P&D	WV P&D	X	X	X
27/08/2022	X	X	WV P&D	WV P&D	WV P&D	WV P&D	suspect prints?	WV P
18/09/2022	WV P	X	WV P&D	X	WV P	WV P&D	WV P	WV P&D
08/10/2022	No Basket	Clay Needed	WV P&D	WV P&D	WV P&D	Clay Hard	Brook Dry	X
23/11/2022	X	X	WV P&D	WV P&D	WV P&D	WV P&D	X	X
29/01/2023	X	WV P	WV P&D	X	WV P	WV P	WV P	X
18/02/2023	WV P	X	WV P&D	WV P&D	WV P&D	WV P&D	X	X
12/03/2023	X	X	WV P	X	WV P&D	WV P&D	X	WV P
10/04/2023	WV P	WV P&D	WV P	X	X	WV P	X	X
29/04/2023	WV P	WV P&D	X	X	WV P&D	WV P&D	X	X
27/05/2023	WV P&D	WV P&D	X	X	WV P&D	WV P&D	X	X
11/06/2023	X	WV P	WV P	WV P	X	WV P&D	X	X
29/07/2023	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X	Missing
31/08/2023	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X	X
21/09/2023	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X
15/09/2023	WV P&D	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X
31/10/2023	X	WV P&D	WV P&D	X	WV P	WV P	X	X
12/11/2023	WV P	WV P	WV P&D	X	X	WV P&D	WV P	X
23/12/2023	X	WV P&D	X	WV P	WV P	WV P&D	X	X
03/02/2024	WV P&D	WV P&D	X	WV P	WV P	X	X	X
10/02/2024	WV P	X	WV P&D	WV P&D	WV P	X	X	X
28/02/2024	X	WV P	X	WV P&D	X	WV P&D	X	X
17/03/2024	WV P	X	WV P & D	WV P & D	X	X	WV P	X
29/03/2024	WV P&D	X	X	WV P&D	WV P&D	WV P&D	WV P&D	X
04/05/2024	WV P&D	WV P&D	WV P&D	X	WV P&D	WV P&D	WV P&D	X
27/05/2024	WV P&D	WV P&D	WV P&D	WV P	WV P&D	X	X	X
28/06/2024	WV P&D	X	WV P	WV P&D	X	WV P&D	WVP	X
04/08/2024	X	X	WV P&D	WV P&D	WV P&D	WV D	WV P&D	X
11/08/2024	X	WV D	WV D	WV P&D	X	WV D	X	X
04/09/2024	WV P&D	WV P&D	X	WV P	X	WV P&D	X	X
26/10/2024	X	WV P&D	X	WV P	WV P	X	X	WV P&D
10/11/2024	X	WV P&D	WV P&D	WV P&D	WV P&D	WV P&D	X	X
01/12/2024	WV P	WV P&D	WV P&D	X	WV P&D	WV P	X	WV P
14/12/2024	WV P & D	WV P & D	WV P & D	WV P & D	X	WV P & D	X	X
12/01/2025	WV P	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P	WV P & D
22/02/2025	X	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	X	WV P & D
16/03/2025		WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	X	WV P & D
29/03/2025	WV P	WV P&D	WV P&D	WV P	X	WV P&D	X	X
12/04/2025	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	WV P & D	X	X

Notes: WV = Water Vole P = Prints D = Droppings X = Nothings Seen / M = Mink Signs

Appendix 6: Photographs Taken on Water Vole Survey During 24th April 2025

Photo 1: Water Vole Raft in Overflow Carpark	Photo 1: Water Vole Raft in Overflow Carpark
	
Photo 3: Water Vole Raft in East Lake 1	Photo 4: Water Vole Raft in East Lake 1
	
Photo 5: Eastern Lake	Photo 6: Eastern Lake
	

Photo 7: Eastern Lake	Photo 8: Eastern Lake
	
Photo 9: Eastern Lake	Photo 10: Eastern Lake
	
Photo 11: Eastern Lake	Photo 12: Eastern Lake
	

Photo 13: Eastern Lake	Photo 14: Eastern Lake
	

Appendix 7: Invasive Non-Native Species Risk Assessment

Current date:	26th April 2024
Likely date(s) of activity:	2nd June - 14th September
Risk Assessment completed by:	Louise Cooper
Location:	Cosmeston Lakes Country Park (Eastern Lake)
Description of the site:	The site consists of a large eutrophic lake, with the east and west sides joined by a narrow. The area of the lake measures ~0.1km2. The lake is largely bordered by woodland, lines of trees, and footpaths, with some open grassland areas, particularly around the eastern lake. The wider landscape consists of a mosaic of woodlands, agricultural land, and urban areas, with a large golf course directly north. The site lies approximately 3.3km south of Cardiff Bay at its closest point, a waterbody known to host various aquatic INNS, and Sully Brook runs from the east of the site, round the southern side of the lakes, and onto the west. Additionally, the Bristol Channel lies 0.8km at its closest point to the east of the site.
Reason for the assessment:	To minimise potential spread of INNS
Invasive non-native species (INNS), pests or diseases known to be on or near the site:	*Dreissena polymorpha (zebra mussel)* *Fallopia japonica (Japanese knotweed)*
INNS, pests or diseases likely to be of concern to your site (horizon scanning):	*Dikerogammarus villosus (killer shrimp)* *Dreissena polymorpha (zebra mussel)* *Elodea nuttallii (Nuttall's waterweed)* *Fallopia japonica (Japanese knotweed)* *Harmonia axyidis (harlequin ladybird)* *Heracleum mantegazzianum (giant hogweed)* *Hippophae rhamnoides (sea-buckthorn)* *Impatiens capensis (orange balsam)* *Rosa rugosa (Japanese rose)* *Sedum album (white stonecrop)*
Vulnerable species, habitats or other assets that may be affected:	*Starry stonewort*

Biosecurity Risk Assessment

Activity	Staff or team involved in the activity	Equipment	Biosecurity risk	INNS, pest, disease	Risk reduction measure 1	Risk reduction measure 2	Revised likelihood score	Revised severity score	Revised risk score	Is the revised risk score sufficiently low to allow the task to continue? Y/N
Operation of aquapark	*Aqua Park staff*	*Aqua Park inflatables. Anchor points; Fixings and ropes; Rental wetsuits; Rental buoyancy aids; Sectional pontoon; and Boats.*	*Introduction of INNS, pests and diseases to the site by bringing contaminated equipment onto Cosmeston Lakes via aquapark equipment or vehicles on site or spreading INNS to Cosmeston Lakes from other sites.*	*The activity could introduce any INNS pest or disease to the site. List of potential species that could be introduced from Cardiff Bay are listed in table above.*	*Cleaning Equipment was cleaned using a pressure washer in order to remove vegetation, mud, algae, biofilm, any other biological material, and other potential contaminants. No chemicals were used in the cleaning process. Air Drying The equipment was air dried prior to storage. Wet suits and ropes were dried in a well-ventilated area away from direct sunlight to avoid damage. Storage The equipment was put into dry storage for a minimum of 8 months in a steel shipping container. Silica gel packs were used to absorb excess moisture. Wetsuits and buoyancy aids were hung rather than being folded, to retain their shape*	*On-site signage about INNS visible to customers* *Highlight Check, clean, Dry Message* *Staff briefings and visitor induction* *Printed leaflets Website bookings and booking confirmation messages including information on INNS*	*1*	*2*	*2*	*Y*

					and prevent moisture trapping. Ropes were stored loosely coiled and off the floor.					

Biosecurity Equipment needed for biosecurity measure(s)	**When will the measure(s) be implemented**	**Staff/team responsible for implementing biosecurity measures**	**Staff member responsible for compliance check**	**Date of compliance check to ensure measure is in place**	**Have the measures been put in place?**	**Action to resolve non compliance, who will undertake the action and the date when the action will be completed**
Biosecurity kit (bucket, water, brushes, pressure washer).	*Measures implemented since closure of Aqua Park in Cardiff Bay during September 2024.* *Measures will be implemented during operational use of the Aqua Park.*	*To be confirmed.*	*To be confirmed.*	26th April 2025. During installation of aquapark and daily during its operation.	*Yes*	N/A