

Ms Kylie Fitzpatrick  
Department of Environment, Parks and Water Security  
PO Box 3675  
DARWIN NT 0801

Dear Ms Fitzpatrick

**Re: Invite to comment - Equatorial Launch Australia - Phase 2 Expansion Arnhem Space Centre**

The Department of Environment, Parks and Water Security (DEPWS) has assessed the information submitted for the above proposal and provides the following comments.

**Flora and Fauna Division**

Based on a search of DEPWS databases within 30km of the project area, expert knowledge of species' habitat requirements, and information about habitats occurring within the tenement, the following threatened species may occur within or immediately adjacent to the project area.

Common Name	Scientific Name	TPWC Act*	EPBC Act*
Lesser Sand Plover	<i>Charadrius mongolus</i>	Near threatened	Vulnerable
Curlew Sandpiper	<i>Calidris ferruginea</i>	Critically Endangered	Critically Endangered
Far Eastern Curlew	<i>Numenius madagascariensis</i>	Critically Endangered	Critically Endangered
Great Knot	<i>Calidris tenuirostris</i>	Critically Endangered	Critically Endangered
Greater Sand Plover	<i>Charadrius leschenaultia</i>	Vulnerable	Vulnerable
Red Knot	<i>Calidris canutus</i>	Endangered	Endangered
Black-footed Tree-rat	<i>Mesembriomys gouldii gouldii</i>	Endangered	Endangered
Common Brushtail Possum (north-western)	<i>Trichosurus vulpecula arnhemensis</i>	-	Vulnerable
Fawn Antechinus	<i>Antechinus bellus</i>	Endangered	Vulnerable
Northern Quoll	<i>Dasyurus hallucatus</i>	Critically Endangered	Endangered
Pale Field-rat	<i>Rattus tunneyi</i>	Vulnerable	-
Northern hopping mouse	<i>Notomys aquilo</i>	Vulnerable	Endangered
Northern Brush-tailed Phascogale	<i>Phascogale pirata</i>	Endangered	Vulnerable
Mertens' Water Monitor	<i>Varanus mertensi</i>	Vulnerable	-
Olive Ridley Turtle	<i>Lepidochelys olivacea</i>	Vulnerable	Endangered
Hawksbill Turtle	<i>Eretmochelys imbricata</i>	Vulnerable	Vulnerable

Common Name	Scientific Name	TPWC Act*	EPBC Act*
Green Turtle	<i>Chelonia mydas</i>	-	Vulnerable
Flatback Turtle	<i>Natator depressus</i>	-	Vulnerable
Partridge Pigeon (eastern)	<i>Geophaps smithii smithii</i>	Vulnerable	Vulnerable
Scalloped Hammerhead	<i>Sphyrna lewini</i>	-	Vulnerable
Peternandra	<i>Pterandra coerulescens</i>	Vulnerable	-
Sticherus	<i>Sticherus flabellatus</i>	Vulnerable	-
Erythroxyllum	<i>Erythroxyllum sp.</i> Cholmondely Creek	Endangered	Vulnerable

\* Territory Parks and Wildlife Conservation Act 1976

\*\* Environment Protection and Biodiversity Conservation Act 1999 (Cth)

Migratory Shorebirds, Marine Turtles, Scalloped Hammerhead: The coastal and marine environment where payloads are expected to return are known for large numbers of nesting waterbirds, migratory shorebird habitat, extensive seagrass beds that are important foraging grounds for marine turtles and dugongs. The potential impact to these values from payload return and retrieval are likely to be minimal provided payloads are recovered from Gulf waters. If payloads are not recovered within a short timeframe, parachutes present a risk of entanglement for marine megafauna and the Scalloped Hammerhead.

Northern Quoll, Mertens' Water Monitor: There is a moderate potential for these species to occur onsite. Historically, both species were relatively common but underwent significant declines due to the arrival of Cane Toads. The proposal to expand the Arnhem Space centre is unlikely to exacerbate this threat.

Black-footed Tree-rat, Common Brushtail Possum (north-western), Partridge Pigeon (eastern) and Northern Brush-tailed Phascogale: These species are generally associated with long unburnt and well-developed Eucalyptus Woodland and Open Forest which may be present within and/or adjacent to the proposal. Targeted surveys undertaken in 2015 for the Gulkula Mine site did not record any of these species, but it is uncertain which areas were targeted for surveying within the Dhupuma Plateau. The Flora and Fauna Division considers that there is potential for these species to occur in intact vegetation despite not being recorded in previous surveys. It is unclear how much intact vegetation is proposed to be cleared and the condition of that vegetation is unknown.

Surveys were undertaken in 2015 for the Gulkula Mine, but were focused on previously cleared areas within the European Launcher Development Organisation site. It is unclear if the adjoining vegetation is suitable for these species and whether those species are present. It is recommended that the proponent provide further detail about the new areas proposed to be cleared and a significant impact assessment for the threatened species that could occur there. This assessment may require targeted surveys for threatened species.

Fawn Antechinus: This species is associated with Monsoon Forests and long unburnt vegetation. The Dhupuma Plateau has been cleared in the past and more recently has been used for bauxite mining. As such, any regrowth within the area is likely to be unsuitable as habitat for this species. Adjacent areas may support suitable areas of habitat and it is unclear how much intact vegetation is proposed to be cleared and the condition of that vegetation. This should be determined by the proponent and would inform an assessment of whether the proposal poses a significant impact to this species.

Pale-field Rat: Habitat for this species is generally associated with riparian vegetation along drainage lines. The proposal is largely located on the Dhupuma Plateau and away from drainage lines that may support this species. It is possible that the species may be present in the drainage depression associated with the new dam. This is a relatively small area that would be impacted compared to the available habitat for the species both downstream and adjacent to the proposal.

Northern hopping mouse: Historic records of this species are known from the west coast of the Gulf of Carpentaria east of the proposal. Suitable habitat for the species focuses around sandy substrates in areas with floristically diverse heathlands and/or grasslands. None of these habitat types appear to be present

within the proposal area. The Flora and Fauna Division considers that it highly unlikely that the species is present and therefore unlikely to be impacted by the proposal.

Pternandra: This species is known to occur in spring-fed rainforests and on the banks of spring fed streams and riparian forests. These habitats are not known to occur within the proposal area. The Flora and Fauna Division considers that the risk to this species is very low.

Sticherus: This species is a small fern that is generally associated with moist gullies and creeks. These habitats are not proposed to be impacted by the proposal. The known records from the Gove area are also a considerable distance (>20km) from the proposal. Given the botanical survey effort in the area, the Flora and Fauna Division is confident that the species is unlikely to be present in watercourses below the Dhupuma Plateau.

Erythroxyllum: This species is known from a single clonal population in the vicinity of Cholmondely Creek approximately 15km north from the proposal. Targeted searches on the Gove Peninsula and west through Arnhem Land have been undertaken by botanists with the species yet to be found in other locations despite extensive survey effort in suitable habitats. Taking into account the previous survey effort, as most of the site has been largely cleared in the past and subject to ecological surveys, the Flora and Fauna Division considers that there is a very low risk of this species occurring onsite and being impacted by the proposal.

Interpretation of aerial imagery and DEPWS mapping suggests that most of the proposal is unlikely to impact on significant and/or sensitive vegetation/features (riparian vegetation, rainforest, sinkholes, springs, etc.). The proposed dam appears to be in a possible drainage depression or creekline. This feature is unmapped and it is unclear if Groundwater Dependent Ecosystems, riparian or wetland vegetation are present or associated with the feature. This should be clarified so the full impact of the proposal can be assessed.

The Flora and Fauna Division is unable to provide advice on the cumulative impact to intact native vegetation as areas of regrowth and intact native vegetation were not identified in the referral document.

#### **Recommendation:**

It is recommended that the NT EPA seek additional information from the proponent to clarify the extent of regrown and intact native vegetation being impacted by the works. This will allow assessment of the potential impact of the proposal on a number of threatened species that potentially occur in intact vegetation types that occur in the broader project area.

#### **Environment Division**

The Environment Division has assessed the above proposal, and comments previously provided on the 27 August 2019, (reference DENR2019/0383) from Environmental Authorisations and Environmental Operations remain the same.

#### **Rangelands Division**

##### **Unzoned Land Clearing**

Pursuant to the *Planning Act 1999*, consent is required for the clearing of native vegetation of more than one hectare in aggregate of land on land subject to the Clearing of Native Vegetation Overlay.

Applications for permits to clear native vegetation on unzoned land are assessed against the requirements of the Northern Territory Planning Scheme 2020.

##### **Weed Management Branch**

All land in the Northern Territory is subject to the *Weeds Management Act 2001* (WM Act). The WM Act describes the legal requirements and responsibilities that apply to all persons, owners and occupiers, of land regarding declared and potential weeds. General duties described in Division 1 of the WM Act include the

requirement for owners or occupiers of land to take all reasonable measures to prevent land being infested with a declared weed, and to prevent a declared weed from spreading.

A desktop assessment of the NT Weeds Database for the proposed area, surrounding areas and adjoining land has revealed current and or previous data records of the following weeds:

Common Name	Botanical Name	Declared
Hyptis	<i>Mesosphaerum suavelens</i>	Class B
Spinyhead sida	<i>Sida acuta</i>	Class B
Mission grass perennial	<i>Cenchrus polystachios</i>	Class B

Under the WM Act, Class B weeds require growth and spread to be controlled.

'Preventing Weed Spread is Everybody's Business' is a document highlighting the areas of risk for all activities associated with weed spread. The document, available at: [https://denr.nt.gov.au/\\_data/assets/pdf\\_file/0011/257987/preventing-weed-spread.pdf](https://denr.nt.gov.au/_data/assets/pdf_file/0011/257987/preventing-weed-spread.pdf), details the pathways through, which weeds are spread and provides actions to reduce weed spread. Proponents seeking to develop land for any purpose should address these actions.

The proponent must ensure that all vehicles and machinery are free of weeds, weed seeds, soil and vegetative material prior to entering or exiting the site. Vehicles must avoid driving through weeds already present on-site to prevent further spread. Vehicles and machinery exhibiting such material must be thoroughly washed down before entering/departing.

Any works that cause disturbance to vegetation and soils will create conditions favourable for the growth of weed species, and weed control will be required following disturbance caused by exploration and/or extraction. Weed control prior to seed set should be carried out in all areas affected by these works.

Information regarding weed management is available at: <http://www.nt.gov.au/environment/weeds> or alternatively contact the Weed Management Branch for further advice on (08) 8999 4567

### **Water Resources Division**

The Water Resources Division has reviewed the proposal, and it is unlikely that there will be a significant impact from the extraction of surface or groundwater to support the project. There is insufficient information in the proposal to establish water requirements.

Should you have any further queries regarding these comments, please contact the Development Coordination Branch by email [DevelopmentAssessment.DEPWS@nt.gov.au](mailto:DevelopmentAssessment.DEPWS@nt.gov.au) or phone (08) 8999 4446.

Kind regards,



Maria Wauchope  
Executive Director Rangelands  
4 December 2023

27 August 2019

Kylie Fitzpatrick  
Department of Environment and Natural Resources  
GPO Box 3675  
Darwin NT 0801

Dear Ms Fitzpatrick

**Re: Further Information for Comment Equatorial Launch Australia - Arnhem Space Centre, East Arnhem Land**

The Department of Environment and Natural Resources (DENR) has assessed the information contained in the above application and provides the following comments:

#### **Flora and Fauna Division**

Advice from the Flora and Fauna Division previously concluded that the risk of significant impacts to threatened species and marine biodiversity values from the proposal was low. The additional information has not changed this advice or introduced new risks that may significantly impact on the values associated with two of the Northern Territory Environment Protection Authority's (NT EPA) environmental factors - Terrestrial Flora and Fauna; and Marine Flora and Fauna.

#### **Recommendations**

While the risks to biodiversity values are considered low, the Division reiterates its previous advice which included the following recommendations:

- that all reasonable and practical measures be taken by the proponent to use existing tracks during retrieval operations
- that payloads be rapidly retrieved by the proponent from marine environments to reduce the risk of entanglement by marine megafauna in payload parachutes.

#### **Environment Division**

The application has been considered with respect to responsibilities under the *Waste Management and Pollution Control Act 1998* (WMPC Act).

The following comments highlight areas that need to be addressed by the proponent to mitigate environmental impacts from the proposal.

### Environmental Authorisations Branch

Based on the further information request response there appears to be no new information that would trigger requirements for licensing:

An Environment Protection Licence (EPL) is required for the operational collecting, transporting, storing, recycling, treating or disposing of a listed waste on a commercial or fee for service basis, other than in or for the purpose of a sewage treatment plant, in accordance with section 30(1) of the WMPC Act.

An Environment Protection Approval (EPA) is required for: 'constructing, installing or carrying out works in relation to premises, other than sewage treatment plants, for the storage, recycling, treatment or disposal of listed wastes on a commercial or fee for service basis', in accordance with section 30(2) of the WMPC Act.

The NOI does not appear to trigger a requirement for an EPL or an EPA under the WMPC Act.

In all operations and at all times there is a need to ensure compliance with section 12 and section 14 of the WMPC Act.

Under the *Water Act 1992*, migration of any wastewater to land or water will trigger requirements for an application for a Waste Discharge Licence (WDL), in accordance with section 16 of the *Water Act 1992*.

The NOI does not appear to trigger a requirement for a WDL under the *Water Act 1992*.

The proponent must not, unless authorised to do so, cause either directly or indirectly, waste to come into contact with water or water resources to be polluted.

### Environmental Operations Branch

The following documentation was provided to Environmental Operations for comment:

- Air Emissions Analysis of the Black Brant IZ Launch Vehicle for the Northern Territory EPA (Shoal, June 2019)
- Air Quality Assessment of a commercial spaceport, Northern Territory (Katestone, July 2019)
- ELA NOI Response to NT EPA third RFI - June 2019 [01 draft 03]
- ELA NOI response to NT EPA third RFI - Preamble [01 draft 01]

These documents have been reviewed in the context of Environmental Operations' previous comments. In addition, the Director of Operations participated in a meeting on 2 August 2019 with the proponent and Environmental Assessment Branch staff. Key matters raised by Environmental Operations Branch are included below.

#### Air Emissions and ground-concentration levels

As previously requested, the NT EPA is interested in offsite impacts and how air emissions meet NSW/Victorian impact assessment criteria (criteria). The difference between the Victoria (class 2 and class 3 pollutants) and NSW criteria is that Victoria uses 3 minute averages which equates to 1 hour averages for NSW.

Table 1 of the Air Quality Assessment (Katestone Environmental Pty Ltd) must be amended to report on criteria applicable in the Territory (NSW criteria). DENR need to be able to compare air emissions modelling results to the NSW criteria. Table 10 is required to be updated to include predicted ground level

concentrations against the NSW criteria and for each sensitive receptor location eg Garma Festival Site/sacred site, Gulkula mine camp, nearby public road, Yirrkala and any other sensitive receptors within 10km of the proposal site.

The proponent stated that the NSW/Victorian criteria will likely be exceeded. Justification and rationale for the potential exceedances is to be discussed (eg the temporary nature of emissions, dispersing in upper layers, the short term nature of any impact, risks and the like).

The proponent is to clarify which aluminium species are emitted from proposed rockets and if aluminium chloride is a constituent that will be emitted (and if so, provide an indication of potential concentrations and potential impacts).

The proponent stated that NASA does not see sounding rockets as having a significant environmental impact. This information should be provided to the NT EPA to consider as part of their assessment.

#### Soil, vegetation, surface water and ground water

The proponent has provided basic information indicating a number of areas of uncertainty, including risks to soil, surface water, groundwater and vegetation in the vicinity of the launch sites from exhaust gases released during launches. The NOI outlines adaptive processes proposed to assess and mitigate site and stormwater contamination following construction and operation of the facility. However, while adaptive management processes will be necessary to refine environmental management practices at the launch site, the proponent must also demonstrate that the activities will be appropriately designed, located and mitigate risks to prevent environmental harm.

The proponent should address the current uncertainties and describe proposed mitigation measures to protect vegetation, surface water and groundwater in the areas immediately surrounding the launch facility. This should include:

- 1) A quantitative assessment of the potential distribution of relevant contaminants in the area surrounding the launch pads and the related dimensions of the impermeable area (the 'containment area') required to capture all stormwater from potentially contaminated areas
- 2) A stormwater management plan detailing infrastructure, equipment and measures to prevent the discharge of contaminants becoming entrained in stormwater within the potentially contaminated areas, including measures to:
  - a) capture, store, treat, and reduce the volume of contaminated stormwater
  - b) reliably contain stormwater from potentially contaminated areas following a launch until such time that stormwater quality within potentially contaminated areas is of a quality suitable for discharge to the environment (ie 'clean'). The proponent has committed to containing water from the hardstand areas in up to a 1 in 2 year rainfall event, however the duration of the design rainfall event has not been specified. This commitment lacks meaning in terms of the likely frequency and volumes of overflows of contaminated stormwater.
  - c) the proponent should develop a water balance model to determine the design attributes of the stormwater storage/evaporation basins necessary to accommodate the stormwater generated through successive rainfall events, while accounting for the effect of evaporation in reducing stormwater volume. The design process should define an appropriate frequency of overflows.



- d) ensure appropriate off-site disposal of contaminated stormwater and associated waste materials.
- 3) plans for monitoring of soil and stormwater, from areas inside and outside of the launch pads to detect any potential physical-chemical and toxicant contamination, including details of the appropriate:
    - a) sampling locations, frequency and timing
    - b) water quality parameters and associated trigger levels for further investigation
    - c) mitigation methods to address contaminant issues that may arise during operation
    - d) reporting regime.

The Air Quality Assessment (Katestone Environmental Pty Ltd) states:

- The estimated concentration of aluminium in water is predicted to comply with the freshwater quality guideline of 0.8µg/L beyond approximately 1.5km from the launch site under the normal launch scenario.
- The estimated concentration of aluminium in water is predicted to exceed the drinking water quality guideline of 200µg/L within approximately 3km from the launch site under a worst-case conflagration scenario.

Clarify water users and uses within 1.5km of the site and 3km of the site and potential impacts of the predicted concentrations on their water use. The proponent is to provide information regarding closure, including future land use and assurance that the site is left uncontaminated.

#### Fallen debris and rocket components

The collection of rocket stages and the debris from unsuccessful launches has been suitably identified by the proponent as very important for the retaining of current environmental values of the relevant areas. It appears that helicopter retrieval of these items is preferable to any removal methods that create vehicle tracks, vegetation disturbance and erosion.

The proponent should commit to public reporting, including:

- notification under section 14 of the WMPC Act
- public notification in the event of any failure to retrieve fallen debris or rocket components associated with launches (including failed launches).

The proponent should also consider the potential to improve the current condition of land areas relevant to the launch facility through implementing a program to clean-up and remove existing waste and litter.

From a review of the documents, the additional information provided relates to point 1 under the theme of 'soil, vegetation, surface water and ground water'. The Environmental Operations Branch are unable to see where the additional comments made have been addressed. The Branch therefore still seek information to address points 2 and 3 above, and management of fallen debris and rocket components. It would be beneficial for the proponent to provide itemised responses to specific agency comments, to facilitate the review process to occur in a timely manner.

Any queries in relation to this matter should be directed to Michael Browne, Planning Team Leader, on (08) 8924 4149 or by email via: [eia.ntepa@nt.gov.au](mailto:eia.ntepa@nt.gov.au).



Should you have any further queries regarding these comments, please contact Maria Wauchope by email [maria.wauchope@nt.gov.au](mailto:maria.wauchope@nt.gov.au) or phone (08) 8999 3692.

Yours sincerely

A handwritten signature in black ink, appearing to read 'LDR'.

Luis Da Rocha  
Executive Director, Rangelands

