

STATEMENT OF ENVIRONMENTAL EFFECTS

PROPOSED RECREATIONAL FLIGHT SCHOOL

1070 PRINCES HIGHWAY, FROGS HOLLOW

OCTOBER 2017



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1 INTRODUCTION

1.1 BACKGROUND

This Statement of Environmental Effects (SEE) has been prepared by NGH Environmental Pty Ltd (NGH) on behalf of Sports Aviation Flight College Australia Limited (SAFCA). This SEE has been prepared to support a development application (DA) seeking Council's consideration of a proposed recreational flight school at Frogs Hollow.

Development consent is sought under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The proposed development is funded by SAFCA and the estimated development cost is \$9.5million.

The purpose of this SEE is to describe the proposal and the likely impacts of the development on the environment and to detail the mitigation measures that would be implemented to minimise the potential impacts of the proposed activity.

The proposed development is not deemed to be a designated development (pursuant to Schedule 3 of the Environmental Planning and Assessment Regulation 2000), given the proposed thresholds do not exceed the requirements set out under Section 2 Aircraft Facilities of the Regulation. Therefore, Bega Valley Shire Council will be the consent authority.

This report shall be read in conjunction with accompanying plans and documentation listed in Table 1-1 below.

Table 1-1 Accompanying Plans and Documentation

Reference	Description	Prepared by
S518-01	Detailed Survey	Tasman Engineering Consultants
S518-02	Localisation Plan	Tasman Engineering Consultants
S518-03	Development Plan Showing Proposed Infrastructure – Stage 1	Tasman Engineering Consultants
S518-04	Development Plan Showing Proposed Infrastructure – Stages 1 - 9	Tasman Engineering Consultants
S518-05	Access Road Plan	Tasman Engineering Consultants
S518-06	Main Building - Ground Floor Plan	Tasman Engineering Consultants
S518-07	Main Building - Roof Plan	Tasman Engineering Consultants
S518-08	Main Building - Section and Elevations	Tasman Engineering Consultants
S518-09	Workshop - Ground Floor Plan and Roof Plan	Tasman Engineering Consultants
S518-10	Workshop - Section and Elevations	Tasman Engineering Consultants
S518-11	Hangars – Ground Floor, Roof Plan and Bowser Location Plan	Tasman Engineering Consultants
S518-12	Hangars – Section and Elevations	Tasman Engineering Consultants
S518-13	Squadron Compound – Ground Floor Plan	Tasman Engineering Consultants
S518-14	Students Accommodation Building – Ground floor Plan and Roof Plan	Tasman Engineering Consultants
S518-15	Students Accommodation Building – Section and Elevations	Tasman Engineering Consultants
S518-16	Laundry Plan – Section and Elevations	Tasman Engineering Consultants

Reference	Description	Prepared by
S518-17	Classroom Plan, Section and Elevations	Tasman Engineering Consultants
S518-18	Canopy Over Utility Area Roof Plan and Elevations	Tasman Engineering Consultants
S518-19	Communal Area Plans and Elevations	Tasman Engineering Consultants
S518-20	Carpark – Ground Floor Plan and Roof Plan	Tasman Engineering Consultants
S518-21	Carpark Elevations	Tasman Engineering Consultants
	Letter regarding operations	Recreational Aviation Australia
	Fuel Hazard Analysis Report SEPP 33 (Oct 2017)	Whancorp Pty Ltd
	AHIMS Webservices (AWS) Search Result	NSW Office of Environment & Heritage
17-434	Biodiversity Assessment	NGH Environmental
	Recreational Aviation Australia Operations Manual	RAA
	Traffic Impact Assessment	Tasman Engineering Consultants
TJ958-01F01	Acoustic Assessment	Renzo Tonin Consultants
S-518	Onsite Wastewater Management Plan	Tasman Engineering Consultants
S-518	Fire Protection and Water Supply Plan	Tasman Engineering Consultants
9714	BCA Fire Safety Capability Assessment	GN Consulting

1.2 APPLICANT AND LAND OWNERSHIP

The applicant is Sports Aviation Flight College Australia Limited. The land is rated to Mr Eric and Mrs Patricia Johnston.

1.3 SUBJECT LAND AND LOCALITY

The subject land is Lot 1 DP 109606, 1070 Princes Highway, Frogs Hollow. A cadastral image of the land is provided in Figure 1-1.

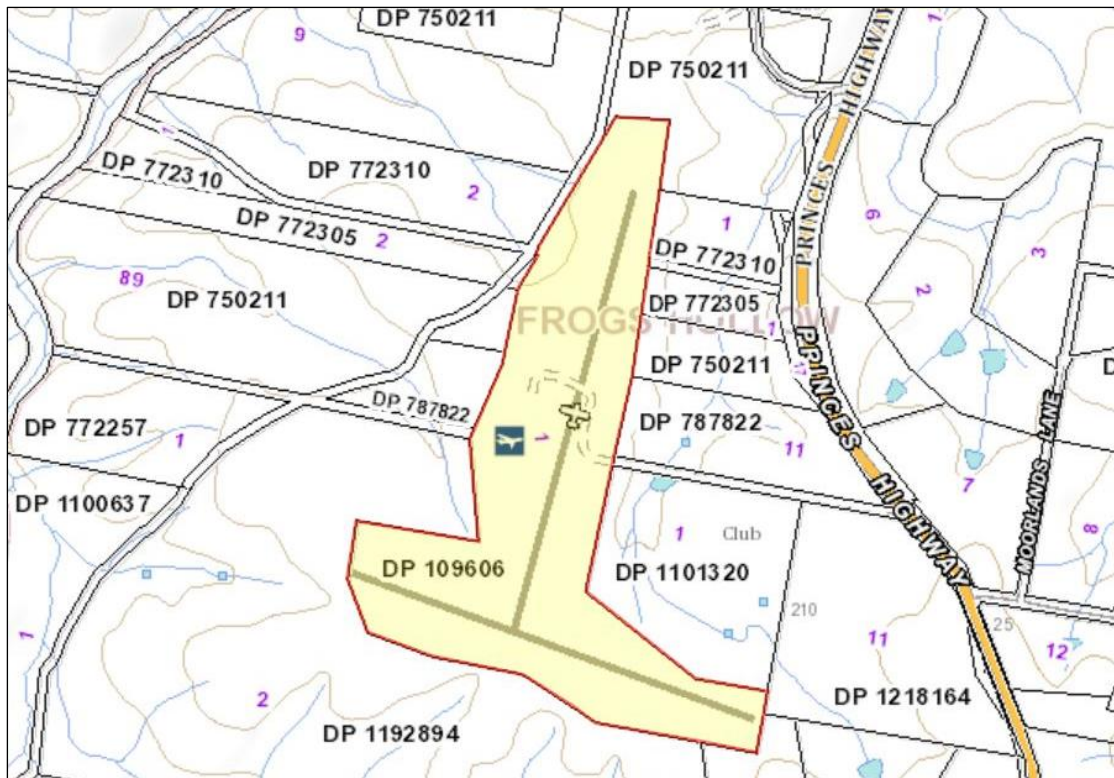


Figure 1-1 Subject land (Source: SIX Maps)

The subject land is sited on the western side of the Princes Highway in the locality of Frogs Hollow. Frogs Hollow is a rural area located approximately 10 kilometres southwest of the Bega CBD. The location of the site with respect to the Bega CBD is shown in Figure 1-2 below.

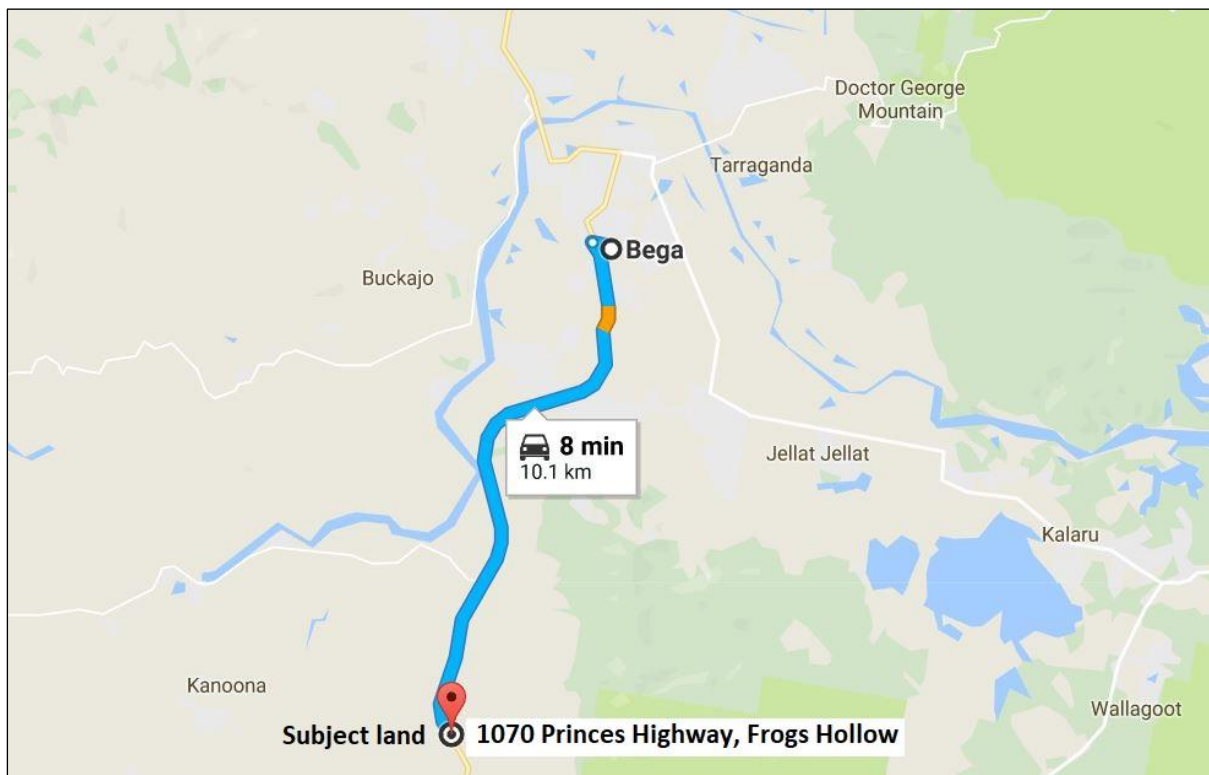


Figure 1-2 Location of the subject land (Source: Google Maps)

2 THE DEVELOPMENT PROPOSAL

2.1 GENERAL OVERVIEW

The development proposal involves the establishment of Sports Aviation Flight College Australia that specifically responds to the growing need for recreational flight training in China.

Traditionally, China has had a closed airspace policy that has prevented the establishment and growth of a recreational aviation sector. Historically, China's airspace has been controlled by the military and the Chinese commercial sector. This changed in 2015, with the government deregulating the airspace and putting in place a strategy to grow the general aviation market, which included recreational aviation.

The term recreational aviation is used to describe the flying of aircraft for the purpose of enjoyment. As Australia is considered to be among the leading nations in the world in aviation safety, the long-term vision is to open colleges elsewhere in Australia using the development proposal as a model.

This proposal seeks approval to establish the first flight college in the Bega Valley. The proposed development would provide opportunity to build on the strong relationship between China and Australia to benefit both countries and their local communities.

In Australia the recreational aviation sector is regulated by Recreational Aviation Australia (RAA), which is overseen by the Civil Aviation Safety Authority (CASA). The proposed facility will be operated in accordance with the RAA's Operations Manual to ensure strict compliance with the governing body. The RAA specifies the rules and regulations that must be adhered to when performed. A letter from the RAA is submitted for Council's reference.

With the recreational aviation market in China in its infancy, SAA has been created to service this growing market for recreational flight training in China. The proposed recreational flight school would be the first of its kind in Australia.

2.2 PREVIOUS MATTERS BEFORE COUNCIL

On 30 October 2014, a representative from the SAA met with Council's Development Advisory Panel to discuss the proposal to establish a recreational flight school at the Frogs Hollow airstrip. The proposal presented to Council was essentially the same proposal that is the subject of this application. The proposed development included an ancillary educational establishment and the incorporation of premises for retail, business, recreational, residential and industrial uses and hangars for aircraft storage, maintenance and repair. Council advised that the proposal was permissible and nominated land uses could be considered under the provisions of the Infrastructure SEPP and the SP2 zone.

In a letter dated 13 November 2014, Council advised that lodgement of an application for the proposal would need to be supported by the following documentation:

- An acoustic assessment.
- A traffic impact assessment.
- A flora and fauna assessment.
- A detailed site plan indicating the location of all existing and proposed structures and infrastructure.
- A detailed site analysis plan, indicating adjoining land uses, site constraints, topographical features.

- A detailed Statement of Environmental Effects that would include assessment against Designated Development thresholds for Aircraft Facilities.
- An Onsite Effluent Management Report, detailing the proposed system and method of effluent management for all the facilities to be accommodated on the site. Details of the proposed management regime for irrigated areas of the site, including the airstrip, would also need to be detailed in the report.
- A fire protection water supply for firefighting purposes as well as a potable water supply to service the proposed facilities.

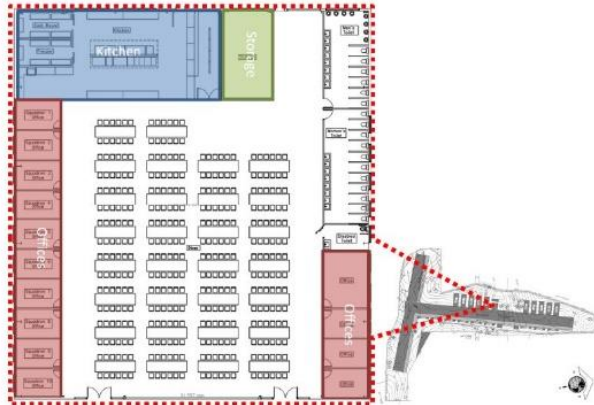
In accordance with Council's direction, the above matters have been considered and evidence supporting the proposed development is submitted for Council's consideration.

2.3 PROPOSAL

The proposed development would provide packages to students that includes accommodation, meals, tuition and flight training. The proposed development is based on a modular system with each module being a squadron. Each squadron consists of 36 students at any one time and teaching resources and facilities are allocated to each squadron.

The proposed facilities would include elements listed in Table 2-1 below. The following table should be read in conjunction with the development plan set (Tasman Engineering Consultants) and the BCA Fire Safety Capability Assessment (GN Consulting) provided for Council's reference.

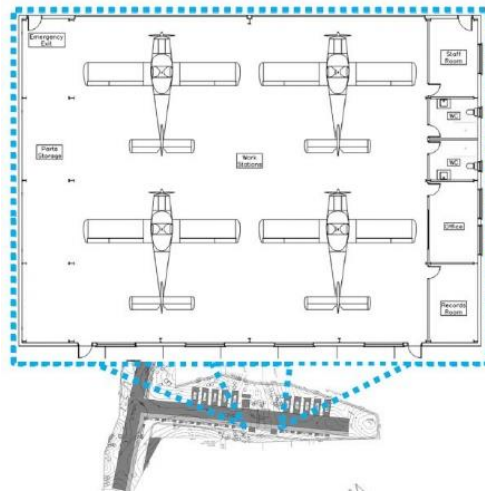
Table 2-1 Elements comprising the development proposal

Element	Function
Main building x 1 Class 5 (Offices) and Class 9b (Assembly / dining area)	<p>The proposed main building is single storey. The proposed building would be utilised for dining and assembly and other associated uses including a kitchen, bathrooms and minor storage.</p> <p>Indicative floor plan is shown in the image below.</p> 

Workshop buildings x 2
 Class 8 (Maintenance workshop)

The proposed workshop buildings are single storey. The proposed workshop buildings would be utilised for the purpose of assembling and maintaining aircraft.

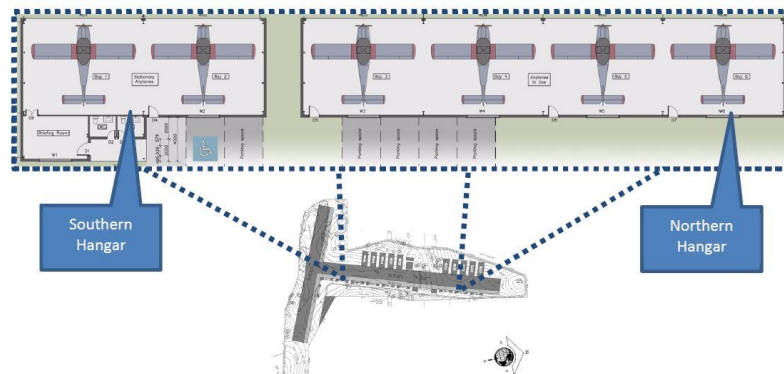
Indicative floor plan is shown in the image below.

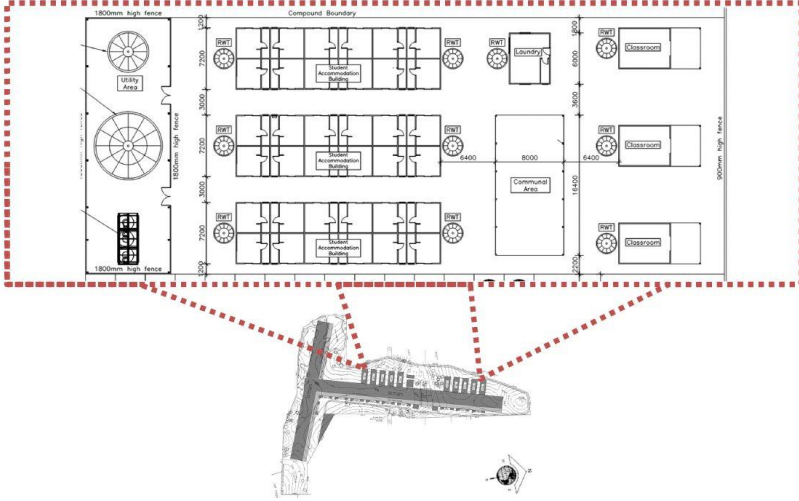


Hangar buildings x 20 -
 (10 x 2 buildings)
 Class 7b (storage)

The proposed hangar buildings are single storey. The proposed buildings would be utilised for the storage and refuelling of aircraft. The buildings would include a briefing room and bathroom facilities.

Indicative floorplan is show in the image below.



<p>Squadron Compounds x 10</p> <p>Class 3 (accommodation – school), Class 9b (classroom and communal area) and Class 10a (utility area and laundry)</p>	<p>The proposed squadron compounds would comprise a single storey building. Each squadron compound will comprise the following buildings:</p> <ul style="list-style-type: none"> • 3 x student accommodation buildings • 3 x classroom buildings • 1 x communal area • 1 x laundry building • 1 x utility area <p>All compounds will have identical construction and site layout.</p> 
<p>Carpark Building Class 7a (carpark)</p>	<p>The proposed development would include the construction of single storey, undercover staff carpark. Construction would comprise an awning style structure with steel frame and corrugated sheeting.</p>
<p>Roads</p>	<p>Construction of internal access roads including the upgrade of the intersection between the Princes Highway and the existing access road.</p>
<p>Bridge</p>	<p>Construction of a new bridge located along the right of way access road.</p>
<p>Water Storage Tanks</p>	<p>It is proposed to install water storage tanks with a combined volume of 3.8 mega litres. Proposed water storage tanks will include a combined storage volume of 352 kilolitres for each squadron building, 40kilolitres to the main building and 20 kilolitres to each hangar and each workshop.</p> <p>The proposed layout is indicated in Figure 2 of the accompanying Fire Protection and Water Supply report.</p>
<p>Fuel Storage Tanks</p>	<p>Light aircraft fuel would be stored onsite in either one or two self-bunded double-walled storage tanks with a total capacity of up to 60 kilolitres. These would be located on the eastern side of the proposed hangars and underground piping would connect to the dispensers on the taxiway in the forecourt of the hangars.</p>

2.4 STAGING OF THE DEVELOPMENT

The proposed development will be completed in nine separate stages over a period of up to five years.

2.4.1 Stage 1 Construction

Stage one will comprise the construction of the proposed main building, workshops, two squadron compounds, two sets of hangars, roads and bridge.

2.4.2 Stages 2 - 9 Construction

Stages two to nine will include the balance of construction work that would be completed over a four-year period, with each stage being constructed within six months.

Stages two and five would include the upgrade of the intersection.

2.5 BUILDING DESIGN AND CONSTRUCTION MATERIALS

The proposed buildings will comprise a steel frame construction with Colorbond roof and wall sheeting on a concrete slab. The proposed colour scheme is mid tone greys.

2.6 HOURS OF OPERATION

The flight school would be operational during daylight hours only. For aircraft safety, it is prohibited to operate outside of such hours.

The students would be in residency for a period of 12 weeks, 24 hours per day

2.7 EMPLOYMENT

The proposed development once fully operational would employ 201 FTE staff members. This would include flight instructors, aviation English instructors, flight theory instructors, squadron leaders and assistants, chefs and maintenance and administration support.

3 ENVIRONMENTAL ANALYSIS

3.1 SITE ANALYSIS

The subject land has the legal description of Lot 1 DP 109606, 1070 Princes Highway, Frogs Hollow.

The allotment is an irregular shape and has an area of approximately 40 hectares (comprising 98 acres and 14 perches, indicated on the deposited plan).

An extract of the deposited plan is shown below as Figure 4-7.

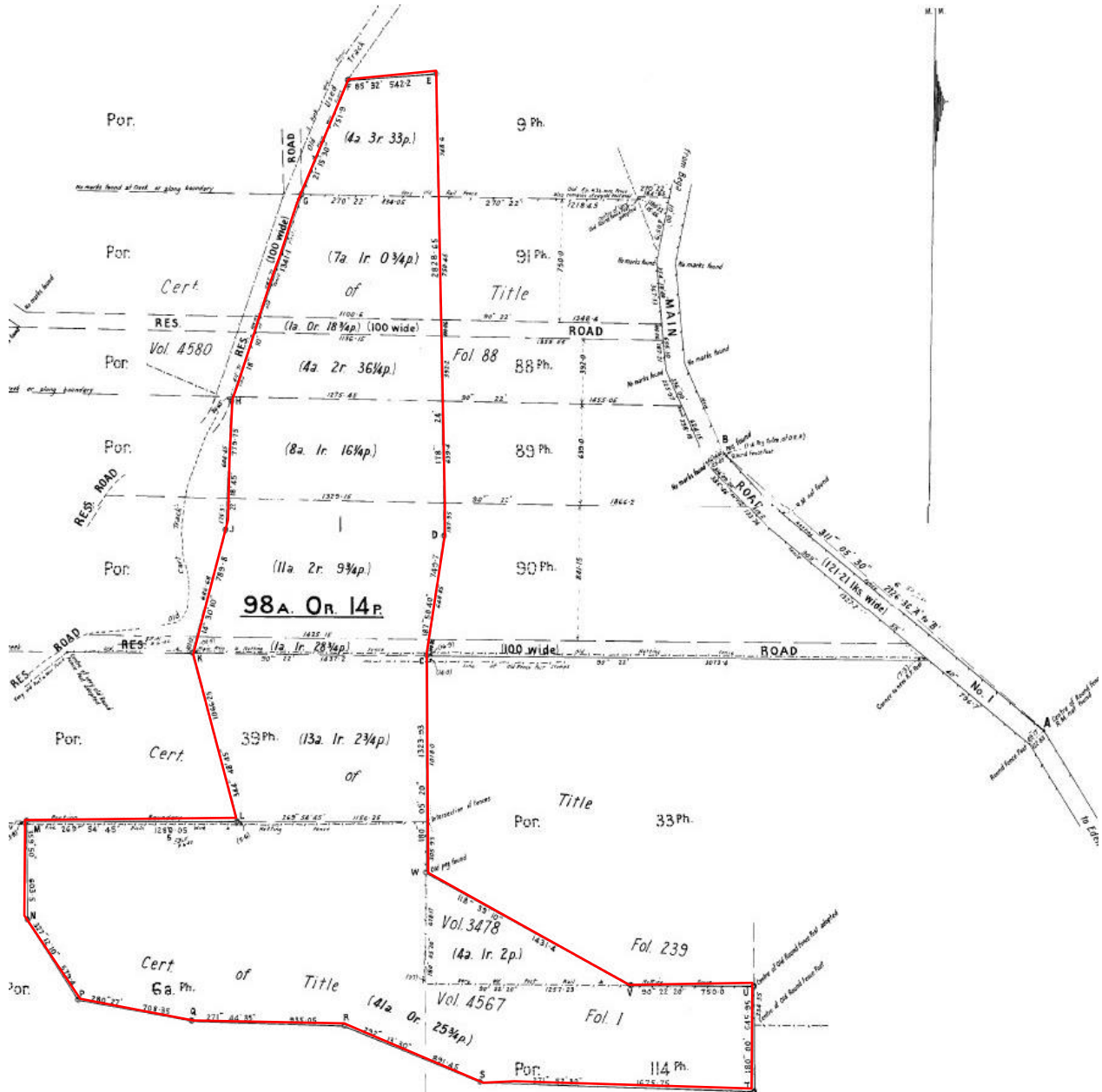


Figure 3-1 Extract of Deposited Plan – DP109606 (Source: GlobalX)

The land is in the locality of Frogs Hollow, situated on the western side of the Princes Highway.

Access to the site is via an unsealed, gravel road, which forms an intersection on the western side of the Princes Highway. The unsealed access road terminates within the subject land.

The Princes Highway, in this location, is rural in context with grassed side verges and sealed carriageway. Verges contain remnant vegetation.

The figure below indicates the local road network and the location of the existing access to the site.



Figure 3-2 Road network and existing site access (Source: Google Street view)

3.2 LANDFORM, CHARACTER AND AMENITY

Site topography is gently undulating, with the highest elevation at approximately 108m ADH located in the south-eastern portion of the land.

The character of the site is rural, defined by surrounding agricultural land uses that includes, cropping and grazing activities. The immediate local amenity is described as an airport. The subject land is zoned SP2 Infrastructure and dedicated for the purposes of an Air Transport Facility.

The land contains the functioning Frogs Hollow Airport, which was established in 1937. Frogs Hollow is the oldest airport in the Bega Valley. The airport comprises a mowed, 1000m airstrip that runs north-south along the land, with a secondary airstrip running east-west. Present on the land are buildings and other elements ancillary to the existing airport activity. The land is currently used as a recreational flight facility and contains the Frogs Hollow Aeroclub. It is proposed to relocate the aeroclub to another designated location on the site, in accordance with the development plan set.

The Frogs Hollow airfield is located approximated ten nautical miles north west of Merimbula and provides an alternative strip to the Merimbula Airport.

The subject land is highly disturbed, the site was historically cleared for agricultural purposes and the construction of the existing airstrip. Vegetation across the site is scattered and consists of stands of remnant native species. Heavily treed areas are located in the southwest portion of the land.

The proposed development does not depart from the character of the site and its surroundings.

A detailed survey of the land accompanies this application for Council's reference. A copy of the plan is provided below in Figure 3-3.

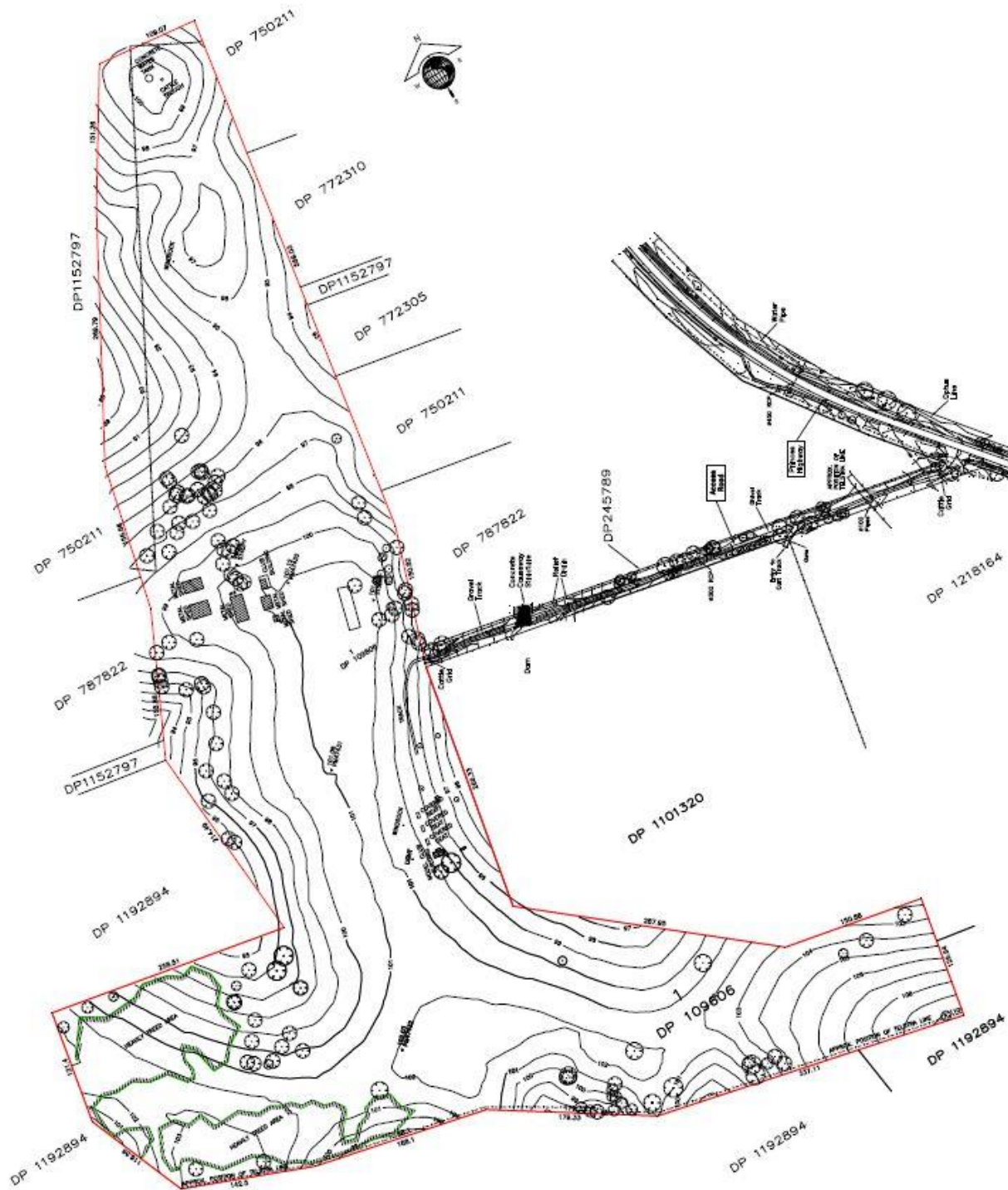


Figure 3-4 Survey plan of the land

3.3 SOILS AND WATER

The soil assessment is based on a visual inspection of surface soils at the site. Preliminary investigations indicate that the soils in the immediate area of the site are comprised of soils derived from granodiorite in the Kameruka suite, referenced on the 1:25,000 Bega Mallacoota Geological Map.

Site inspection revealed the presence of reddish brown sandy clay topsoils, commonly referred to as decomposed granite. Rock outcrops were not observed on the subject land.

Groundwater or a high-water table was not evident on the site. It is not expected that a permanent sub-surface water table would be within 3.0 metres of the surface within the effluent management area.

There are no development restrictions for the site.

3.4 NOISE

An assessment of the acoustic impacts of the proposed development is included as an attachment to this report, which has been summarised below.

The following noise issues related to the operation of the proposed flight school were identified as potentially impacting the nearest sensitive receivers:

- Take-off and landing of recreational aircrafts from Frogs Hollow Airfield;
- Recreational aircrafts flying circuits around the airfield at Frogs Hollow; and
- Recreational aircrafts taxiing and moving around the airfield.

It is proposed that the recreational flight school would utilise the existing main and secondary runways four designated flight circuits as detailed in Figure 2 of the report. Each proposed flight circuit would have a predetermined designated flight profile, as detailed in Figure 3 of the report. It is noted that the aircraft would follow designated circuits around the airfield with no special manoeuvres or aerobatics.

The nearest affected receivers were identified through aerial maps and during a site visit grouped into Noise Catchment Areas as indicated below and at Figure 1 of the report:

- NCA 1 - Residential properties located to the east of the subject site across the Princes Highway,
- NCA 2 - Residential properties located to the northeast of the subject site across the Princes Highway,
- NCA 3 - Residential properties located to the southeast of the subject site

Short term monitoring was undertaken at the locations described in Table 1 of the report, to determine the existing background noise levels. The levels were found to be 29dB(A) for NCA 1 (adjusted to 30dBA in accordance with the INP), 35dB(A) for NCA 2 and 36dB(A) for NCA 3.

According to the Industrial Noise Policy (INP), the intrusiveness of a noise source may generally be considered acceptable if the equivalent continuous (energy-average) A-weighted level of noise from the source (represented by the LAeq descriptor) does not exceed the background noise level measured in the absence of the source by more than 5dB(A). Based on the recorded background noise levels, the relevant intrusiveness criteria were determined as 35dB(A) for NCA 1, 40dB(A) for NCA 2 and 41dB(A) for NCA 3.

Attended noise measurements were undertaken on Monday 18th September 2017. Two test flights were completed for each designated flight circuit and the noise generated by the aircraft flybys during each flight circuit were measured at the measurement locations (S1, S2 and S3). The measurement results and the

worst-case equivalent noise level of one aircraft flyby integrated/corrected over a 15-minute period (ie. LAeq,15min) are summarised in Table 6 of the report.

The results indicate that the equivalent LAeq,15min noise levels for each flight circuit complies with the applicable noise criteria at each NCA, excepting aircraft flybys along Flight Circuit 09 which exceeded the applicable noise criteria by 9dB(A) at receivers within NCA 1. In order to maintain compliance with the applicable noise criteria, the recommended number of aircraft movements for each circuit per 15-minute period is included in Table 8 of the report.

Although Circuit 09 cannot be used for normal operation, as the noise generated during the upwind and crosswind aircraft movement is too significant upon NCA 1, it is noted that the secondary runway can be used for emergency landings as no affected residential receiver is identified on the western side of this runway.

The noise impact assessment report determined that the proposed development could comply with the requirements of the INP and operate within statutory limits, provided the recommendations within Section 4 of the report were implemented.

3.5 FLORA AND FAUNA

An assessment of the biodiversity impacts of the proposed development is included as an attachment to this report, which has been summarised below.

The biodiversity impact assessment report has been prepared under the transitional arrangements for Part 4 assessments with reference to the *Threatened Species Conservation Act 1995* which extend until the 25th November 2017.

An inspection of the site was conducted on the 11th of September 2017 by an ecologist and technical assistant. The survey concentrated on identifying the native vegetation within the site boundaries and the road leading to the proposed site. Targeted surveys were conducted for threatened ecological communities and threatened flora species that were present onsite. The fauna survey involved identifying the types of fauna habitat available within the proposed site including important habitat features as well as incidental fauna sightings.

Flora results and impacts

The proposed recreational flight school site has a disturbance history that has degraded the diversity and regular grazing by cattle has affected the composition. The vegetation present is mapped in Figure 4-1 of the BA report and is characterised as Lowland grassy woodland (tree cover) and Lowland grassy woodland (without tree cover), whilst the exotic dominate is no longer considered native vegetation.

The Lowland grassy woodland (without tree cover) is not a listed threatened ecological community under the Act, in light of its very low native species diversity and apparent absence of native forbs. The Lowland grassy woodland (tree cover) vegetation community was found to satisfy the NSW scientific communities determination of the Biodiversity Conservation 2016 Act listed Endangered Ecological Community Lowland Grassy Woodland in the South-East Corner Bioregion. The community in the south-western corner of the site may satisfy the criteria for the EPBC Act Critically Endangered Ecological Community listing, although part of this community is outside of the proposal site and no development is proposed within this area.

Of the 5.67 ha of clearing required, 4.43 ha is deemed native vegetation and 0.87 ha is deemed EEC in moderate to good condition. The development would remove 0.87 ha of EEC, of the 10.82 ha that occurs within the site boundaries.

The habitat evaluation in Appendix B of the report indicates that the habitat on the site is not suitable for any of the species known to occur in the region. Given this and the fact that the proposed development should have minimal impact on either vegetation community, an assessment of significance of impacts (in accordance with the significant impact criteria provided under the NSW TSC Act) is not considered necessary for any threatened flora species.

Fauna results and impacts

Threatened fauna species that could potentially occur onsite are discussed in Section 4.3.2 of the report and assessed in Appendix A. The woodland community may provide good complex habitat for food and shelter resources and the forest also includes some older trees with potential nesting hollows that might suit some of the hollow nesting birds, bats and gliders. The size of this relatively small forest area, may limit the habitat potential of the area particularly in relation to food resources, unless some of these species can forage successfully more widely in the forest and woodland dispersed within the locality.

Dominant fauna identified on the site consisted of the Noisy Miner (*Manorina melanocephala*). The Noisy Miner is listed as a Key Threatening Process under the Threatened Species Conservation Act, and the presence of this species may account for a scarcity of other birds within the woodland on the site. It is known to competitively exclude other bird species and is abundant onsite.

Increased flights at the site will increase the risk of collisions between birds and aircraft, which can be a significant threat to aircraft safety. There have been no previously known issues with bird collision from the current Frogs Hollow aviation club (pers. comm. N. Boyle, Sept 25, 2017). The site is not near any known congregation areas (such as wetlands). Given the dominance of Noisy Miners at the site, which competitively exclude many woodland birds, the potential of the development to affect bird flight paths or generate significant collision events is considered to be low.

As discussed in Section 4.3.2 of the report, the subject land provides some potential habitat for threatened fauna species. The habitat evaluation in Appendix A however, deemed most species unlikely to occur. As such, the proposed development is not expected to result in impact to any listed threatened fauna species at either the commonwealth or state levels. Given this, an assessment of significance of impacts (in accordance with the significant impact criteria provided under the NSW TSC Act) is not considered necessary for any of these species.

3.6 LAND HAZARDS AND RISKS

3.6.1 Flood prone land

The subject land is not located on a floodplain, as indicated in Figure 3-10 below.

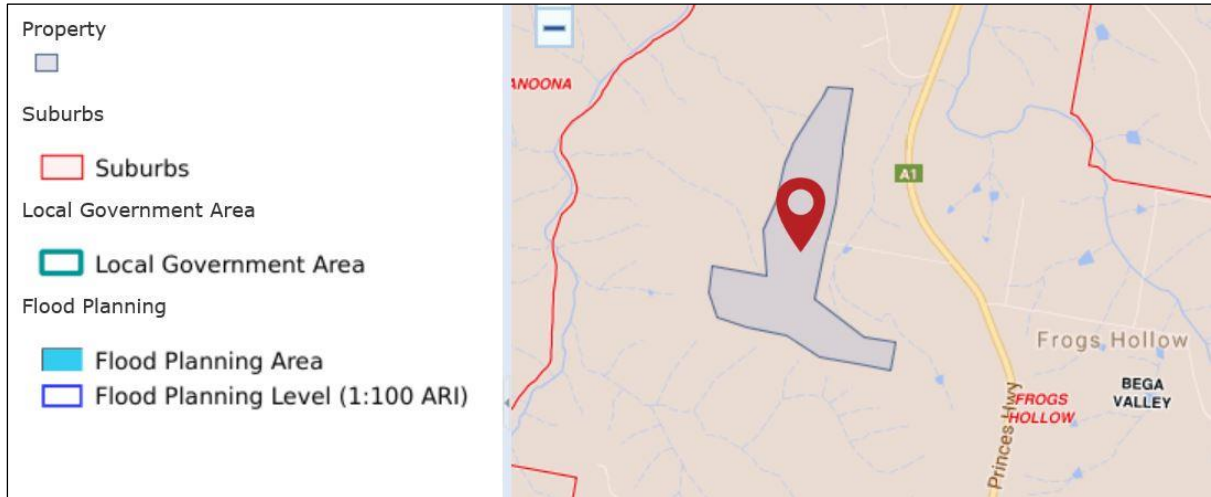


Figure 3-5 Subject land and its proximity to flood prone lands (Source: NSW Planning Portal)

3.6.2 Bush fire prone land

The subject land is classed as bushfire prone land, as indicated in Figure 3-10.

Consistent with the aims and objectives of Planning for Bushfire Protection 2006, vehicle access is readily available to the subject land from the highway. A managed area would be maintained around the proposed squadron buildings. The development would be served with fire-fighting equipment and a static water supply for an emergency situation.

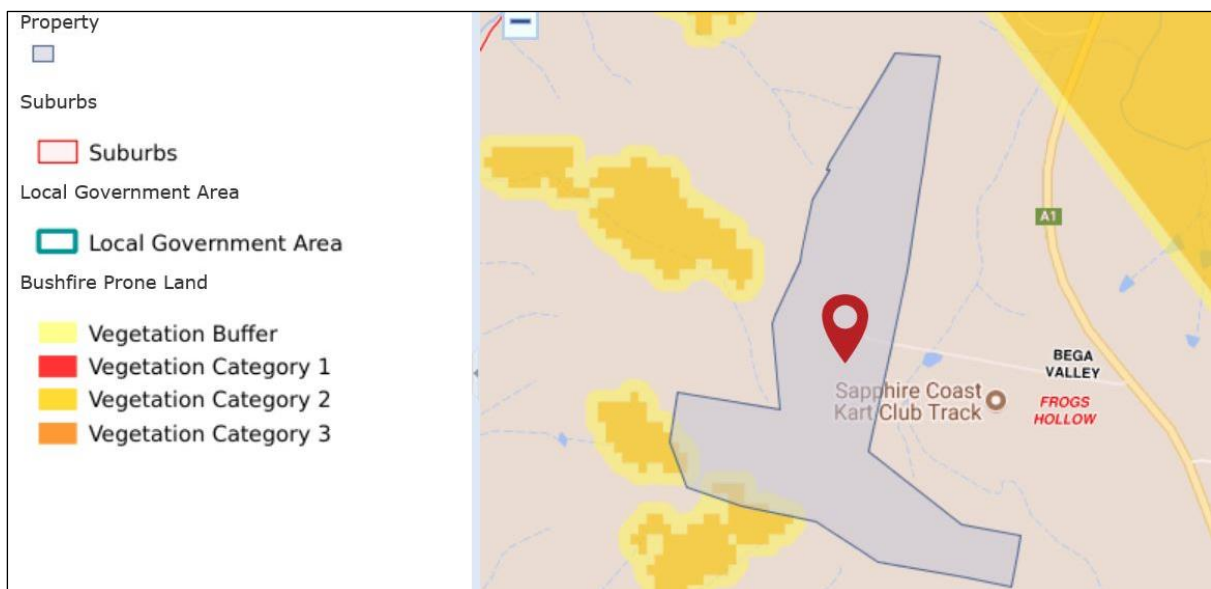


Figure 3-6 Subject land and its proximity to bushfire prone lands (Source: NSW Planning Portal)

3.7 POST EUROPEAN HERITAGE

The subject land does not contain items of Environmental Heritage listed in Schedule 5 of the Bega Valley Local Environmental Plan 2013.

The subject land and its proximity to listed Items of Environmental Heritage is shown in Figure 3-11 below.

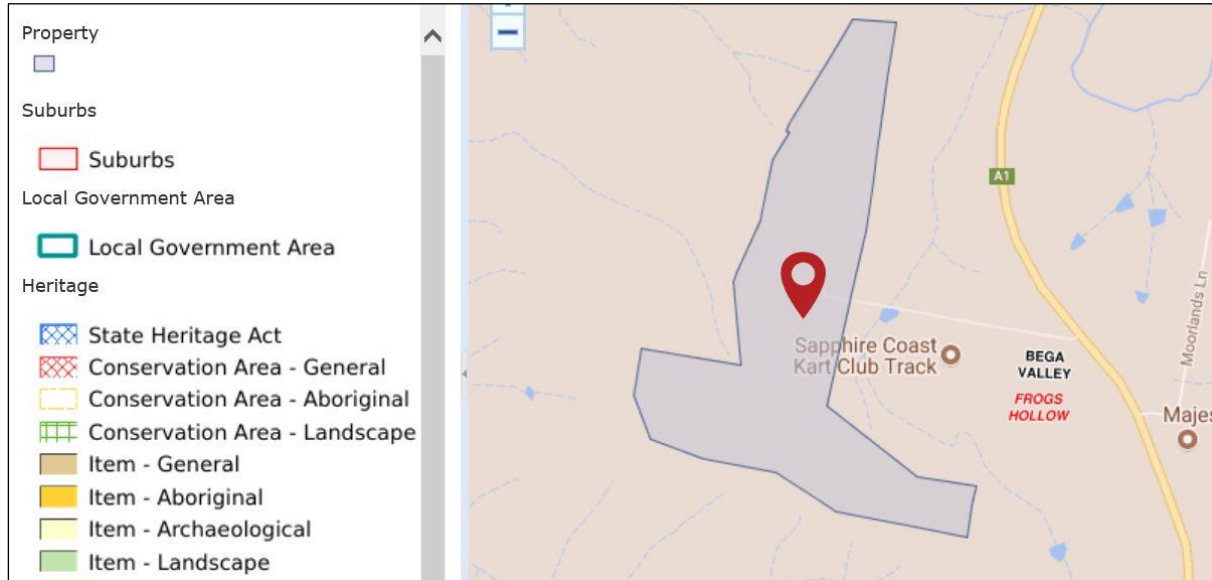


Figure 3-7 Subject land and its proximity to listed Items of Environmental Heritage (Source: NSW Planning Portal)

3.8 ABORIGINAL HERITAGE

The proposal site is highly disturbed due to past activities involved its historical use as an airstrip.

A search of the Aboriginal Heritage Information Management System (AHIMS) found that there are no registered Aboriginal heritage sites located within 200 metres of the proposal site.

The proposal would require earthworks for the construction of buildings. This would have the potential to impact any subsurface heritage items. However, due to the disturbed nature of the proposal site, the potential to impact Aboriginal heritage items is low.

An extract of the AHIMS search result is provided in the figure below and a full copy of the AHIMS search result is provided as an attachment to this report. Note that this assessment does not constitute a Due Diligence assessment under the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (OEH 2010).



**Office of
Environment
& Heritage**

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : 17-434 Frogs Hollow
Client Service ID : 308538

NGH Environmental - Wagga Wagga
Po Box 470
Bega New South Wales 2550
Attention: Lizzie Olesen - Jensen
Email: lizzie.oj@nghenvironmental.com.au
Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 1, DP:DP109606 with a Buffer of 200 meters, conducted by Lizzie Olesen - Jensen on 24 October 2017.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

Date: 24 October 2017



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Figure 3-8 Extract of AHIMS search result (Source: NSW OEH)

4 INFRASTRUCTURE AND SERVICE PROVISIONS

The subject land is located in a rural environment that is not served by Council's reticulated sewer or drainage networks. The land is not connected to reticulated water or natural gas. Electrical and communications connections would be extended to the development site.

4.1 ROAD ACCESS

A traffic impact assessment report is included as an attachment to this SEE.

The internal roads would be built to a standard suitable for the use of heavy rigid vehicles and fire trucks, in accordance with Council's engineering guidelines.

The property is accessed from the Princes Highway, with a sealed access point from the highway to the gate. The access point meets the highway at a 45 degree. The intersection is a hybrid treatment that exceeds the Basic Right Turn (BAR) standard but does not meet the Auxiliary Lane Right Turn (AUR), in that the widened shoulder is sealed but the widened length is inadequate for the 45 degree angle.

Traffic data for the Princes Highway near Frogs Hollow was obtained from the RMS. The data was for the week ending 23rd October 2015 at hourly intervals. An estimation of the current traffic volumes was calculated by obtaining traffic counts at the nearest permanent traffic counter for the three years to 2017. The increases were applied to the 2015 counts for the site and it was assumed in the report that traffic would continue to increase at the same rate for the duration of the construction of the nine development stages.

The peak periods for traffic to and from the site would be 7am to 9am and 4pm to 6pm, associated with the movement of staff to and from the site. The students would be accommodated onsite and would therefore not factor into these peak traffic periods.

The traffic modelling takes into account the proposed staged construction of the development and the consequential staged increases in staffing for the facility. The assessment indicated that the configuration of the existing access and intersection would be adequate to serve Stage 1 of the proposed development, provided the minor works detailed in the report (removal of three trees, line marking) were undertaken. As detailed on pages 2 and 3 of the traffic impact assessment report, intersection upgrades would need to occur with Stage 2 and Stage 5 of the proposed development, to cater for the increasing turning and through traffic.

It is desirable that turning traffic minimises the interference with true traffic, particularly for a road such as the Princes Highway. A critical acceptance gap of 14 seconds and follow up headway of 3 seconds is a desirable outcome. In consideration of Figure A4.1 of the RMS Road Guide, the worst-case absorption capacity at the completion of the development with 544 vph through traffic, it is calculated that the practical absorption capacity is 143 vehicles. This exceeds the maximum hourly in/out movements associated with the proposed development. It is therefore concluded by the traffic engineer that the proposed development would have minimal impact on the efficiency of the Princes Highway.

The traffic impact assessment report concluded that the proposed development would not adversely impact the operation of the Princes Highway.

4.2 WATER SUPPLY

A reticulated water supply is not currently available to the subject land and alternative options have been developed to meet the demand for water. An assessment of the potable and non-potable water consumption and supply for the proposed development is included as an attachment to this report and summarised below.

The proposed facility will require potable water for drinking, ablutions and food preparation and non-potable water for, laundry, toilet flushing, and firefighting. Total water usage is estimated to be approximately 49,200L/day based on typical waste water volumes for resident and non-resident occupancies for non-reticulated systems as per the NSW septic tank accreditation guidelines. For non-reticulated systems where water saving devices are installed, this usage is typically reduced by 20 percent, which would equate to water usage of approximately 39,360L/day.

A water balance assessment is included in Table 3 of the accompanying Fire Protection and Water Supply report. This is based on the use of bottled water for drinking and recycled water for toilet flushing. A minor deficit would be experienced in the months of August, September and October, where supplemental water would need to be imported to the site and stored for usage.

The proposed water storage would include a total water storage volume of 352 kilolitres for each squadron buildings, 40 kilolitres for the main building and 20 kilolitres for each of the hangars and the workshops. The tanks would be interconnected to allow for the transfer of water as required. The total water storage across the development would be approximately 3.8 megalitres.

The water storage would also be required to take into account a water source for firefighting. AS 2419 requires that hydrants supplied by on site storage tanks and a fire pump set also incorporate a booster assembly. They must therefore be capable of delivering 10 litres per second per hydrant for a period of 4 hours, which would equate to a total volume of 288 kilolitres of dedicated firefighting supply.

Planning for Bush Fire Protection 2006 indicates that water supply for firefighting purposes for allotments with an area of 1,000sqm to 10,000sqm require a 10 kilolitre dedicated firefighting and allotments in excess of 10,000sqm require a 20 kilolitre dedicated supply. The area of the proposal site in the immediate vicinity of the proposed buildings comprises approximately 5.5 hectares. Based on the above requirements, this would equate to approximately 70 kilolitres of dedicated water supply. As indicated above, the hydrant tanks would need to supply 288 kilolitres in accordance with the Australian Standard and could therefore meet the site-specific requirement of 70 kilolitres.

It is considered that the proposed development is supported by adequate alternative water supply arrangements in the absence of a reticulated potable water supply.

4.3 STORMWATER

As indicated in the previous section, stormwater will be a vital source of water supply for the proposed development. All stormwater would be harvested from the roof of the proposed buildings and stored for re-use in a number of rainwater tanks. The layout of the proposed tanks is indicated in Figure 2 of the accompanying Fire Protection and Water Supply report.

All other stormwater falling to impervious and pervious surfaces would be allowed to drain naturally to the land. The property is of sufficient size that stormwater would not be concentrated and would not adversely affect neighbouring properties.

4.4 FIRE SERVICES

An assessment of the design of the proposed buildings against the Deemed-to-Satisfy fire safety provisions of the Building Code of Australia is included as an attachment to this report and summarised below.

The fire resistance and compartmentation for the proposed buildings is capable of complying with the prescriptive DtS provisions for Type C construction, under Section C of the BCA. Some additional measures are required for the Class 10a areas of the squadron compounds. The design of the proposed buildings would comply with the relevant DtS provisions under Section D of the BCA, provided the measures outlined in the report are implemented.

The proposed fire protection equipment would include (where relevant to each building):

- A fire hydrant system designed and installed in accordance with AS 2419 to service the entire floor area of the main building (and other buildings as described in the following sections)
- A fire hose reel designed and installed in accordance with AS 2441
- Fire extinguishers in accordance with AS 2444
- Automatic shutdown of the air handling system activated by smoke detectors, if relevant
- Emergency lighting and exit signs designed and installed in accordance with AS 2293
- A sound system and intercom system for emergency purposes designed and installed in accordance with AS 1670

4.5 WASTEWATER MANAGEMENT

The subject land is not served by a reticulated sewerage network and would therefore rely on an on-site sewage management system.

A wastewater assessment prepared by a qualified engineer is provided with the accompanying development application. As indicated in the report, a number of collection tanks and individual sewer treatment units would be attached to the buildings.

The effluent would be treated to a secondary standard with disinfection. Treated wastewater would then be pumped to a series of storage tanks for land use application and static fire-fighting water supply.

The proposed effluent disposal area would be limited to the area of the runways. The area would be irrigated in accordance with AS 1547. The wastewater assessment report considered the site characteristics including geology and soils, drainage and proximity to watercourses and to neighbouring development. The assessment concluded that the runway area would be suited to the effluent disposal as an established grass surface is present and access to the area is restricted and therefore exposure to treated effluent would be controlled.