22 December 2021

D21/129156

Att: Amy Watson
NSW Department of Planning, Industry and Environment
Locked Bag 5022
Parramatta NSW 2124

Email: amy.watson@planning.nsw.gov.au

Dear Amy,

COCKLE BAY WHARF MIXED USE DEVELOPMENT (SSD-9978934)

I refer to the exhibition of the State Significant Development Application (SSDA) and associated Environmental Impact Statement (EIS) for the proposed Cockle Bay Wharf Mixed Use Development (SSD-9978934).

It is understood that DPT Operator Pty Limited (the Applicant) is seeking development approval for the construction of a land bridge across part of the Western Distributor (WD) between Darling Harbour and Darling Park, and a mixed-use 43-storey building. An EIS has been prepared to address matters identified within the applicable Secretary's Environmental Assessment Requirements (SEARs) issued on 12 November 2021.

It is noted that NSW State Government authorities have been identified as key stakeholders, with a requirement for consultation to be undertaken on identified issues. The Environment Protection Authority (EPA), SafeWork NSW (SafeWork), and Fire and Rescue NSW (FRNSW) are considered as key stakeholders within the context of this submission.

Consideration of the space that would be enclosed by the proposed land bridge.
It is understood that the Applicant undertook consultation with Transport for NSW (TfNSW) over an extended period in relation to the proposed land bridge development and the potential impacts resulting from the enclosing of an approximately 150-metre-long section of the WD. As a result of this consultation, an 'Agreement in Principle' was provided to the Applicant by TfNSW in September 2020 for the proposed development. All agencies are willing to engage in discussions should this assist in exploring concerns outlined in this correspondence.

Subsequent stakeholder consultation that has been undertaken by the Applicant has been based on the premise that the enclosure of the space beneath the proposed land bridge

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development does not constitute a tunnel on the premise, that the space 'is not substantially enclosed' and as such the requirements of AS 4825-2011 *Tunnel fire safety* are not required to be addressed.

A tunnel is considered within the context of this submission to be as defined within AS 4825-2011 *Tunnel fire safety* as "a substantially enclosed roadway or track-way greater than 80 metres in length." AS 4825-2011 further states that "what constitutes a tunnel depends on the likelihood of development of untenable conditions. If the degree of cover is less than 75%, the accumulation of smoke is unlikely." Given that the existing WD carriageways would be bounded by the proposed land bridge development (that is, enclosed by wall and roof structures) and that there is a resulting potential for untenable conditions, the EPA, SafeWork, and FRNSW consider this space to constitute a tunnel.

Recommendation

If consent is granted for the project, that DPIE consider the AS 4825-2011 definition of a tunnel in the drafting of conditions relevant to safety such as fire and life safety systems and measures that are typically afforded to modern road tunnels.

A joint agency approach to the management of dangerous goods in tunnels.

The EPA has joint responsibility with SafeWork for the administration and enforcement of dangerous goods (DGs) legislation in NSW. SafeWork also has responsibility for safe workplaces. FRNSW is the primary combat agency for response to urban fires and hazardous materials incidents and has a duty of care to minimise risks to firefighters when managing such incidents.

There is significant commonality in the intent of the above roles in that the function of each agency is to both protect and ensure the safety and wellbeing of people within the State of NSW.

DGs are defined by Part 2, Section 32 *Dangerous goods*, Clause (1) of the Dangerous Goods (Road and Rail Transport) Regulation 2014. Legislation that is specific to the storage and handling of DGs (including their transportation) has been enacted in response to the increased risk of harm to a person, property, or the environment that may result should they be involved in an incident. This legislation seeks to manage risks often by way of elimination where the risk has been determined as unacceptable. This is reflected within the Road Rules (2014) which prohibits the transportation of DGs within a tunnel due to the potential for catastrophic consequences. The EPA, SafeWork, and FRNSW all support this approach and have previously provided a position to TfNSW on the matter in relation to the proposed Coffs Harbour Bypass tunnels (refer to Appendix A). Agency support for this position remains unchanged and is reaffirmed by way of this submission.

Recommendation

It is recommended in determining the proposed development, the Department of Planning, Industry and Environment (the Department) give due consideration to the joint agency position as detailed within Appendix A.

Prohibited routes for the transportation of Dangerous Goods.

The storage and handling of DGs (including their transportation) has been deemed to constitute increased risk of harm to a person, property, or the environment should they be involved in an incident, such that specific legislative controls are necessary.

One such control is prescribed in Part 18, Division 1, Section 300-2 *NSW rule: carriage of dangerous goods in prohibited areas*, Clause (1) of the Road Rules 2014, which states that "The driver of a dangerous goods transporter must not use the vehicle on or in any road or tunnel (or part of a road or tunnel) specified in the Table to this rule (a prohibited area) …". Elimination type risk controls are necessary in cases where there is unacceptable potential for an incident resulting in catastrophic consequences.

Recommendation

That DPIE consult with TfNSW on their intention to prohibit the transportation of DGs through the new tunnel by amending the Road Rules 2014 to list the new tunnel as a 'prohibited area'

Thank you for the opportunity to make this submission and I look forward to our continued collaboration and engagement with the Department on future State Significant Development Applications.

Should you have any questions regarding this letter, please contact FRNSW Assistant Commissioner Trent Curtin by email at Trent.Curtin@fire.nsw.gov.au

Yours sincerely,

Jeremy Fewtrell
Deputy Commissioner
Fire and Rescue NSW

David Fowler
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APPENDIX A

3 September 2020

D20/69923

Mr Peter Regan
Deputy Secretary Infrastructure and Place

Mr Joost de Kock
Deputy Secretary Customer Strategy and Technology
Transport for NSW

By email:
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Dear Sirs,

DANGEROUS GOODS IN TUNNELS – COFFS HARBOUR BYPASS PROJECT

The Environment Protection Authority (EPA) has joint responsibility with SafeWork NSW (SafeWork) for the administration and enforcement of dangerous goods legislation in NSW. SafeWork also has responsibility for safe workplaces. Fire and Rescue NSW (FRNSW) is the primary combat agency for response to urban fires and hazardous materials incidents and has a duty of care to minimise risks to firefighters when managing such incidents.

On 15 July 2020, Transport for NSW (TfNSW) Coffs Harbour Bypass Project team presented to officers from EPA, FRNSW and SafeWork its policy directions in relation to the proposed Coffs Harbour Bypass Project. The agencies were heartened by the conciliatory and consultative approach outlined. However, there were a number of issues identified during the course of the discussion about which the agencies continue to have significant concerns.

TfNSW informed attendees its policy direction was to "design a tunnel through which dangerous goods can be carried".

This language creates the impression that transportation of dangerous goods through the Bypass tunnels is at least possible, if not probable. We understand from subsequent FRNSW discussions with Mr Wakelin-King that the tunnel will in fact be designed to the highest contemporary standards of life and fire safety. If this is the case, we recommend this language be used consistently to avoid a misconception both among our three agencies and, importantly, in the minds of the local community and media.

Our three agencies remain committed to collaborating with TfNSW to achieve these life and fire safety standards for Coffs Harbour Bypass, and indeed all road and public transport projects and services. We will stand shoulder to shoulder with TfNSW to better educate the local community and stakeholders on the risks associated with the transportation of dangerous goods in tunnels, as it is our strong position that such a policy direction (as implied) is unsafe and inappropriate.

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It is contrary to the world's best practice in life and fire safety developed over the planning, construction, commissioning and operation of most current tunnels in NSW, and which has well served the community, operators and regulators. Importantly, an incident involving dangerous goods in a tunnel will expose first responders to significant risk of death or serious injury to protect the community and render an incident safe. To date, no reason has been offered by TfNSW as to why this critical change in public safety policy is being considered for the Coffs Harbour project.

Agencies are concerned about the methodology and scope for the Absolute Risk Assessment.

The three agencies have previously raised significant concerns with TfNSW in regard to both the methodology and the findings contained in Aurecon's draft Comparative Risk Assessment (CRA). A final version of the CRA has not yet been released to the three agencies, and at the same time we understand that Aurecon has been engaged to undertake the Absolute Risk Assessment.

As per our previous feedback, the agencies are seeking TfNSW's assurance that – at a minimum – the Absolute Risk Assessment addresses the following:

- Analysis covers road users, occupants of any buildings in the vicinity, the environment, emergency responders, assets and infrastructure, the functioning of the road network and the economic consequences of an incident in the tunnel
- The degree of exposure to those people and assets affected, not just the number of persons, including road users, present in the adjacent area
- The risks of confinement within a tunnel of any emergency incident, and the retention effects of pressure, smoke and heat, and potential failure of structural integrity
- The differences in evacuation from a tunnel compared to surface environments
- The emergency response capability and capacity differences between a regional/rural area and a metropolitan environment serviced by a network of emergency service units
- An assessment of the full and comprehensive range of dangerous goods transported across both short and longer terms, their classification, form, quantities and seasonality
- An assessment of the risks posed by the loss of containment of dangerous goods
- Assessment across a full range of potential scenarios, including the impact of installed fire protection on dangerous goods that react dangerously with water
- An assessment of the hazards of mixed loads
- A reliable assessment of vehicle crashes, including the accurate representation of frequency
- An assessment by a tool that is applicable to Australian conditions, underpinned by conclusions and assumptions directly related to local risks, conditions and regulations
- Reliable forecasting of population and vehicle traffic growth over the life of the tunnel
- Accurate calculation of fatality impact zones for emergencies, particularly explosions
- Realistic presentation of traffic flows, speeds and vehicle distances, and
- Proper justification for any assumptions made.

Please also find the attached Appendix A - Dangerous Goods in Tunnels, which provides context and a shared policy position for FRNSW, EPA and SafeWork, that may inform TfNSW's consideration of this matter.

We look forward to hearing from you with regard to the above issues, and to our continued collaboration and engagement on the management of dangerous goods on the NSW road and public transport network.

Should you have any questions regarding this letter, please contact FRNSW Assistant Commissioner Mark Whybro by email at mark.whybro@fire.nsw.gov.au or on 0438 602 869.

Yours sincerely,

Jeremy Fewtrell
Deputy Commissioner
Fire and Rescue NSW

David Fowler
Executive Director Regulatory Practice and Environmental Solutions
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Attachment: Appendix A - Dangerous Goods in Tunnels – context and shared policy position for Fire and Rescue NSW, Environment Protection Authority and SafeWork NSW

Appendix A - Dangerous Goods in Tunnels – context and shared policy position for Fire and Rescue NSW, Environment Protection Authority and SafeWork NSW

The issue of transporting dangerous goods in tunnels has been the subject of discussion within the Australasian Fire and Emergency Service Authorities Council (AFAC) Urban Operations and Built Environment Groups. Urban Operations is the senior-most operational forum to discuss issues and develop nationally consistent doctrine for emergency responders. The Built Environment Group is the senior-most fire safety technical committee focussed on improvements in the built environment. The two AFAC Groups have agreed that a national position is to be developed in relation to the transport of dangerous goods within tunnels, which reflects the concerns outlined in this letter.

EPA, SafeWork and FRNSW wish to place on record its concerns with TfNSW's approach to this public safety issue. For this correspondence, a *tunnel* is defined in accordance with the definition of a *long tunnel* in Australian Standard 4825, being any enclosed tunnel greater than 120m in length.

Dangerous goods in enclosed spaces

When released, dangerous goods can be harmful or fatal to humans in two main ways: being in contact with the dangerous goods or the dangerous goods causing a fire or explosion. Contact with dangerous goods can be via direct contact with the solid or liquid material, or via exposure to harmful gases, vapours, dusts or smoke. In the case of fire/explosion risk, when released dangerous goods such as flammable liquids give off flammable vapours that are heavier than air and disperse and mix with air to form explosive atmospheres. Flammable gases disperse in similar ways; however, in an LPG release the liquid gas expands 270 times in volume and therefore rapidly form large explosive atmospheres.

In an open space, it is easier for harmful or explosive atmospheres to dissipate and disperse. Exposure is therefore less likely, and the concentration of exposure (and therefore the harm) is less than an enclosed space.

The greater the degree of enclosure, the less capacity there is for dispersion. Other than within a building, a tunnel presents the greatest degree of enclosure preventing dispersion of dangerous goods gases and vapours. Enclosed spaces also contain the energy and smoke generated by fires.

Enclosure also increases the magnitude and destructive power of an explosion. When an explosion occurs on the surface, much of the blast energy is able to dissipate in a hemisphere centred on the explosion. Confined to a tunnel, this energy can propagate in (at most) two directions, significantly extending the distance over which damage can occur. Furthermore, a road tunnel may contain other vehicles and tunnel appurtenances that can contain and reflect explosive power in a manner that is highly unpredictable.

In the event of a heavy vehicle accident, the likelihood of injury or death from the impact of the moving vehicle is not different if the vehicle is on an open road or in a tunnel. With the exception of an ensuing fire, if dangerous goods are not involved, there is no continuing risk of harm to people after the vehicles have stopped moving.

However, if dangerous goods are involved in a tunnel, people not involved in the initial collision are placed at risk because of the exit constraints. This could lead to a mass casualty incident that would not occur on an open road, where there is the capacity for people to leave their cars and scatter quickly.

Managing incidents in tunnels

Enclosed spaces increase the challenges faced in incident management. The longer the tunnel, the greater the challenges. In addition to the increased potential for the creation of harmful atmospheres, tunnels greatly reduce the incident management options. Fire trucks and crews may have to approach from a single direction, downstream of traffic flow, because upstream will be blocked by trapped vehicles. Depending on the tunnel design, there may be access from the opposite side of the road; however, if the tunnel is divided, the cross-over point for accessing the other tunnel may be up to 120m apart. Radio communications during incidents in tunnels can also prove difficult, adversely impacting operations to render the incident safe.

If the approach is upslope, the fire trucks and crews have the potential for the only approach to be through spilled liquid dangerous goods or a falling vapour cloud. If dangerous goods are involved in the incident and potential for explosion exists, exclusion zones may extend for over a kilometre beyond the limits of the tunnel itself.

Firefighting operations within tunnels require substantial resources, are labour-intensive (requiring sufficient crews for regular rotations), and pose major safety hazards for firefighters, emergency responders and civilians. Within the tunnel, firefighting resources such as water or foam can often only be deployed from a single direction and from ground level, making it difficult to attack the seat of the fire.

In the event of a fire occurring inside a tunnel, smoke will quickly accumulate, severely limiting visibility and creating a toxic atmosphere that will overcome occupants of vehicles or other persons within the tunnel.

Mitigating and aggravating factors

While any length of tunnel increases the risk to motorists and first responders when dangerous goods are involved, the longer the tunnel, the more people are put at risk. Additionally, the greater the traffic flow, the greater the likelihood that the road behind the incident will be completely congested, hampering evacuation and emergency services access.

The shape of the tunnel can also increase the risk, as tunnels with a low point in the middle increase the likelihood of pooled dangerous goods or accumulation of heavier than air flammable/harmful vapours.

The risk of harm associated with dangerous goods also increases with the package size of the dangerous goods. The likely quantity of dangerous goods released from an incident involving a vehicle transporting a large number of small packages is less than a similar incident involving a few large packages. It is therefore especially important to prohibit large packages of dangerous goods, such as large gas cylinders, intermediate bulk containers (IBCs) and tank vehicles from tunnels.

Examples of Explosive or Harmful Atmospheres and Fire Intensity

LPG tanker – 54,000L capacity transporting 45,900L of liquid gas (85% SFL). In the event of rupture of a common semi-trailer LPG tanker of 54,000L capacity, all 45,900L of liquid gas will volatilise, creating over 12,300 cubic metres of pure gas. With a lower explosive limit of approximately 2% an explosive atmosphere of over 600,000m^3 could be created. Such an explosion would kill everyone within the tunnel, have a blast radius out of the tunnel ends and most likely destroy the tunnel.

In August 2018, an LPG tanker exploded in Bologna, Italy, killing two people and injuring approximately 50. The explosion was not enclosed, there was time for evacuation, and this minimised casualties; however, the elevated roadway where the tanker incident occurred collapsed.

45 kg domestic LPG bottle – A standard domestic LPG bottle has 100L capacity and therefore the potential to create an explosive atmosphere of approximately 1,150m^3. The combustion energy of this mass of LPG is more than 2,000 MJ, equivalent to more than 500kg of mining explosive. A truck carrying mixed gas bottles, including domestic gas bottles, involved in an explosion in an enclosed space would likely result in the rupturing of other gas bottles, which can rocket and become lethal projectiles, as well as explode with multiple detonations.

Ammonium nitrate spill transported in flexible IBCs – Explosive grade ammonium nitrate (AN) is transported in 1.2 tonne 'bulka-bags' as class 5.1 dangerous goods (not class 1 explosives). While AN is stable and safe to transport, when contained and subjected to sustained fire it can become sensitised and explosive.

On 5 September 2014, a vehicle carrying 52.8 tonnes of AN left the road and caught fire at Angellala Creek south of Charleville, Queensland. After being impacted by fire, part of the load of AN detonated with the force of approximately 10-15 tonnes of trinitrotoluene (TNT). The detonation caused a seismic event measuring 2.1 on the Richter scale, destroyed two bridges and dispersed parts of the truck in a 1km radius.

800L Chlorine pressure drum (toxic gas) – Chlorine gas is transported in country NSW for use in water purification. It is typically transported in 800 L pressure drums or 'pigs', containing 900 kg of liquefied chlorine when full. Chlorine gas is lethal within minutes at concentrations of greater than 1,000 ppm (3,000 mg/m^3).

If a pig were ruptured in a tunnel, there is no impediment to all 800 L of the compressed gas being released, which has the potential to create 300,000 m^3 of lethal atmosphere. For comparison, a single tube of the St Helena Tunnel has a volume in the order of 50,000 m^3.

Geotechnical survey equipment – Geotechnical survey equipment commonly uses two types of radioactive sources, Caesium 137 (with a half-life of 30 years) and Americium 241 (with a half-life of 430 years). To consider spilled radioactive material safe, the combat strategy is to wait 10 half-lives, at which point it is deemed there is no more radioactivity. If such a source was dispersed in a tunnel, it would be between 300 and 4,300 years before it would be considered safe, if it could not be completely removed or encapsulated.

Dangerous Goods Regulatory Regime

The dangerous goods regulatory regime incorporates numerous controls to mitigate the risks posed by the physical or chemical properties of the chemicals. In all road incidents, the presence of dangerous goods is an aggravating factor with regard to the seriousness and complexity of the incident.

While all chemicals classified as dangerous goods have harmful properties, the risk of harm and the area in which harm is likely increases with the volume of dangerous goods involved. Accordingly, most of the controls and restrictions put into place in relation to the transport of dangerous goods relate to a *placard load*. A placard load is the quantity, for the type or volume of dangerous goods, where if a road incident were to occur, the chemical(s) must be factored into the emergency response.

For most chemicals, a placard load is equal to or greater than 1,000L or kg of dangerous goods. However, for certain high-risk chemicals the placard load quantity can be as low as 250L or kg. At quantities greater than a placard load, there is sufficient chemical risk that the chemicals must be contained/secured before other recovery activities can take place.

A placard load is a term used/mandated nationally and well understood by the transport industry. Accordingly, it is an easily enforced definition for loads that should be prohibited from tunnels. A placard load is the quantity of dangerous goods prohibited from tunnels around Australia and introducing different exclusions will cause confusion and inhibit enforceability.

It is the joint position of the EPA, FRNSW and SafeWork that all placard loads of dangerous goods present an unacceptable risk when transported through tunnels. As the tunnel length, complexity (grades, curves and lane merges) or traffic volume increases, the risk increases.

Very high risk loads

The following list of placard loads are considered very high risk when transported in a tunnel because of their potential to cause infrastructure destruction or a mass casualty event. The following placard loads must not be transported through a tunnel:

- Class 1 (explosives)
- Division 2.1 (flammable gas)
- Class 3 Flammable liquids
- Division 2.3 (Toxic gas)
- Division 5.1 Ammonium Nitrate (UN numbers 1942, 2426 or 3375), or
- Class 7 (Radioactive) – except short lived (half-life of 100 days or less) radioactive substances used for nuclear medicine.

If a decision is made not to exclude these loads from tunnels, that decision is made with the acceptance that the transport of these loads in a tunnel has the potential for a mass casualty event and/or infrastructure destruction.

It is noted that the current exclusion of dangerous goods from the St Helena Tunnel (420m) or the Tugun Tunnel (340m) includes placard loads of class 1, division 2.1 and all mixed dangerous goods placard loads. The EPA, FRNSW and SafeWork request that all placard loads of dangerous goods be excluded from these tunnels.