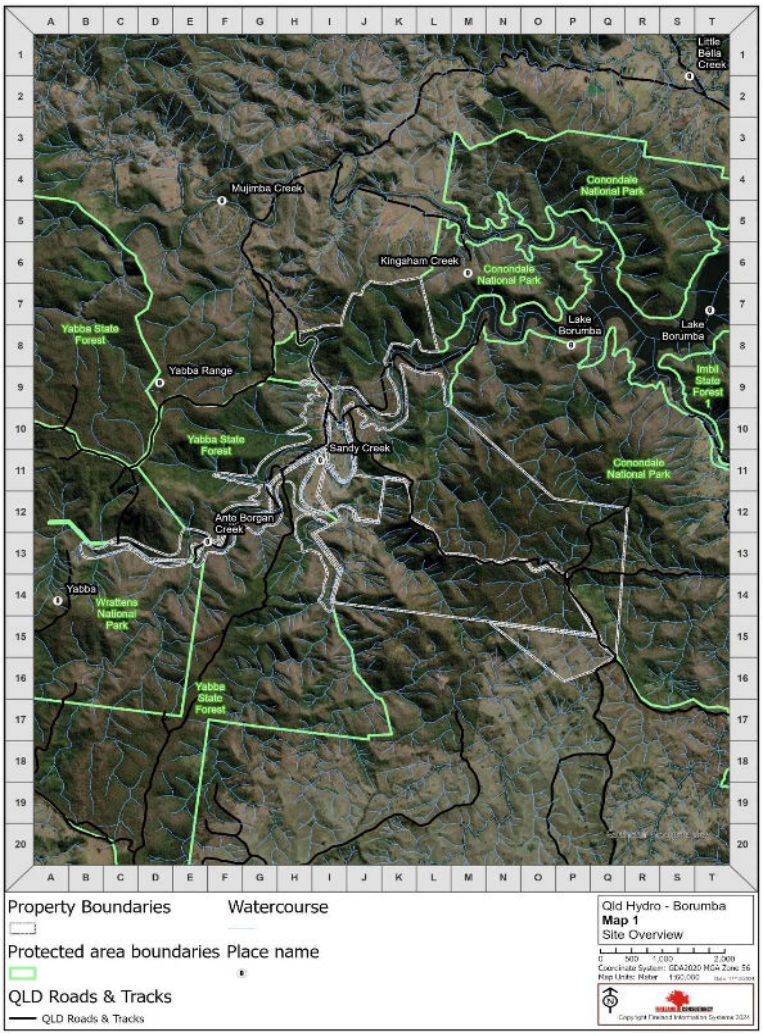
Borumba Project
Bushfire Management Plan – Exploratory Works

1. Introduction and Background

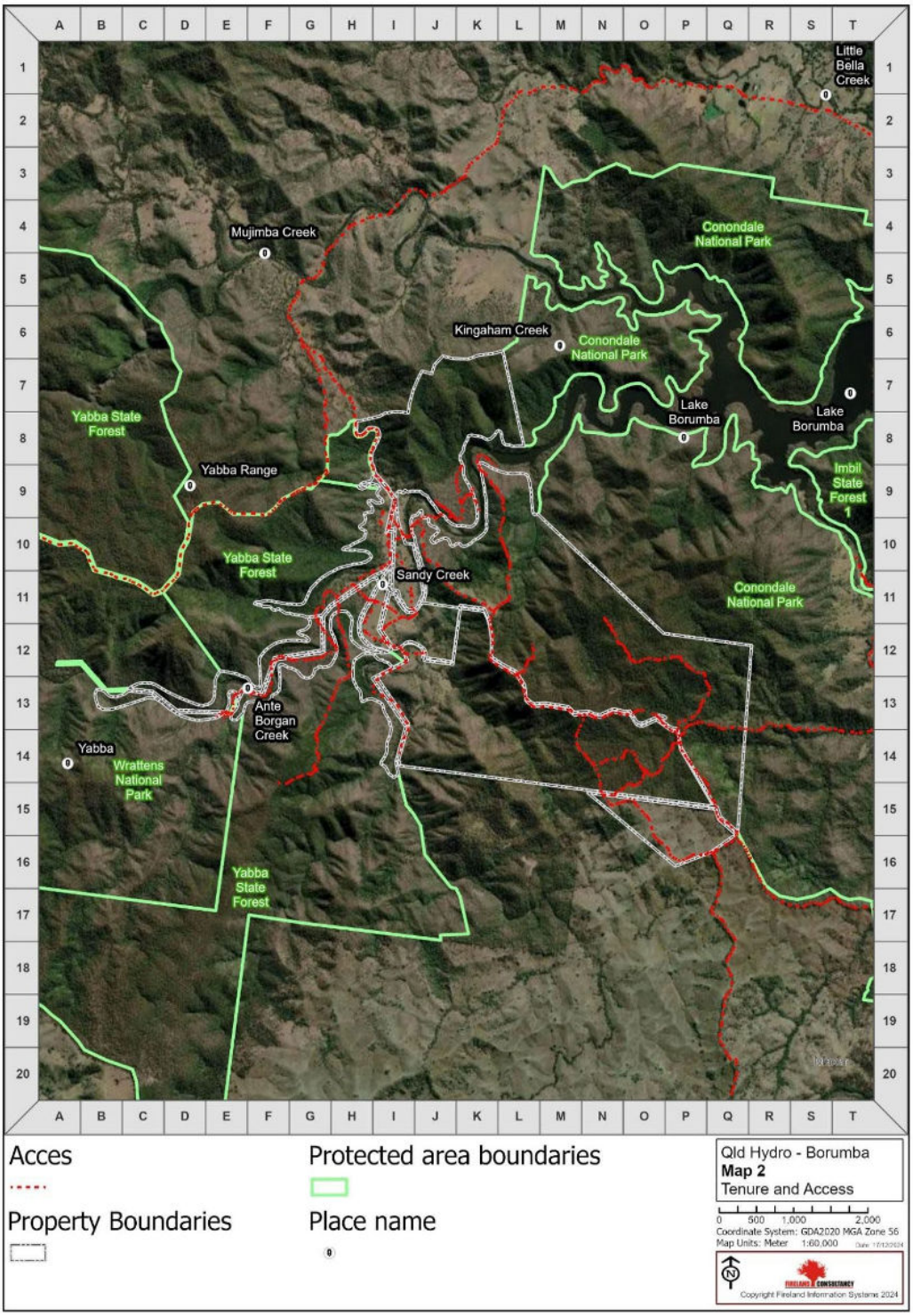
The Queensland Hydro Borumba Pumped Hydro Project site(s) are in areas that are identified as bushfire prone (refer Queensland Fire Department (QFD) mapping) and as such workers, assets and environmental and cultural heritage values are potentially at risk from impact from bushfire. Map 3 below shows the extent of bushfire prone areas across the Project site(s), including non-operational parcels of land owned by Queensland Hydro.

Construction activities that will be undertaken during the Borumba Pumped Hydro Project ('the Project") may also lead to unplanned fires, which have the potential to impact values within and outside of the Project site(s).

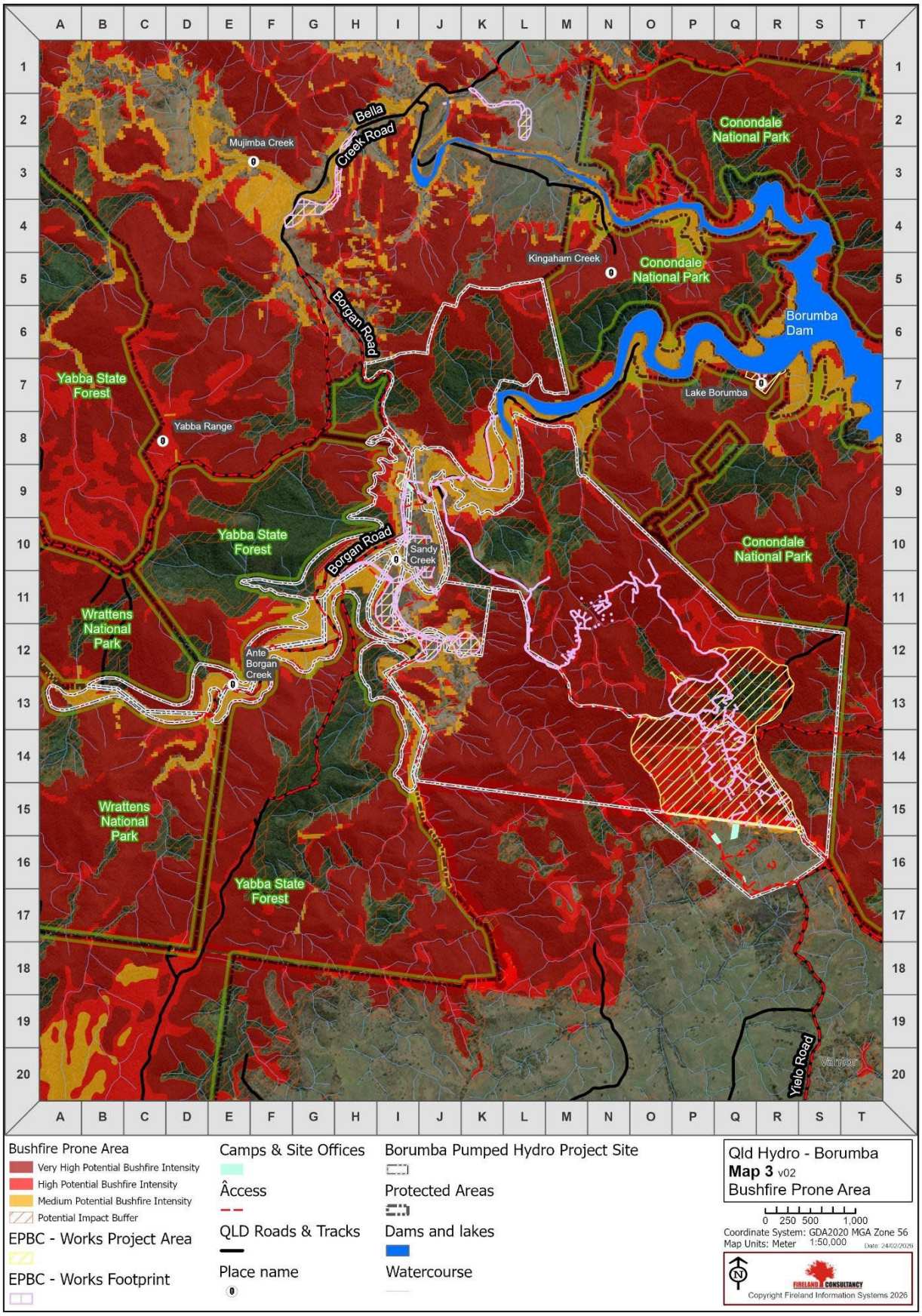
The nature and scope of works as the Project progresses will constantly evolve, and as such the risks posed by bushfire will vary considerably throughout the Project life.



Map 1 – Site location



Map 2 – Site tenure access



Map 3 – Bushfire Prone Areas

2. Purpose

To outline the actions Queensland Hydro will take to achieve the following objectives:

- Prevent unplanned bushfire ignition occurring from Project work activities - workers, equipment and assets.
- Protect people (workers and community), assets and property in the event of bushfire.
- Undertake preventative treatments to minimise the impact of bushfires on environment and cultural values, assets and property, to a standard that is compliant with and meets environmental regulations and Project approval conditions.
- Have appropriate response actions in place to limit the impact of bushfires on people, assets, overall Project site(s) and neighbouring properties.
- Have site preparedness, response and recovery plans to maintain Project continuity during bushfire events.

This Plan should be read in conjunction with the **Borumba Emergency Response Plan (BR-PLN-0002)**, which provides detail on the Project Emergency Management Team structure, roles and accountabilities, key contact details and other key emergency information such as locations of assembly areas.

3. Scope

This plan applies to the **exploratory works** phase of the Project for works under the management and control of Queensland Hydro.

Other Principal Contractors working on the Project are required to have their own bushfire management plan, which must align with the requirements detailed in **Borumba Bushfire Management Guideline – Exploratory Works (BR-FW-NON-HHS-GUI-00001_00).**

4. Bushfire Management Framework

The Project will adopt the prevention, preparedness, response and recovery (PPRR) framework to manage bushfire risk, shown in Figure 1.

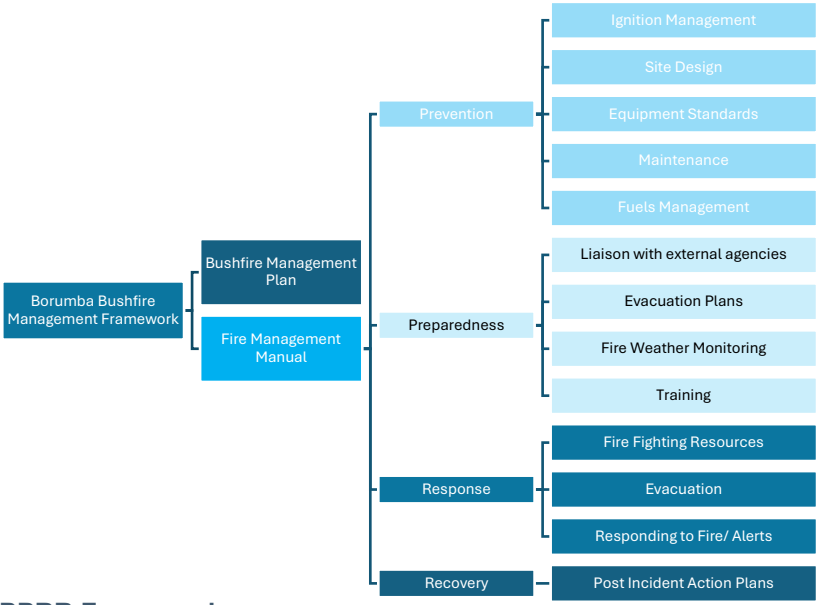


Figure 1 – PPRR Framework

5. Prevention Activities

5.1 Development and implementation of Project Fire Management Manual

A Project **Fire Management Manual** will be in place which provides detail on the actions to:

- minimise vegetation fuel sources on the Project site(s) - e.g. slashing activities, maintenance of asset protection zones and planned hazard reduction burns.
- maintain fire trails across the site(s) to an acceptable condition.

This manual will be developed and maintained by Queensland Hydro's fire management consultant.

5.2 Ignitions Management

5.2.1 Hot Works

Bushfire ignition can occur from sparks generated by hot work activities, which can cause combustion of vegetation. Queensland Hydro will maintain a **Hot Works Permit system**. Examples of hot works activities include welding, cutting, grinding and slashing/ vegetation management.

When issuing a hot works permit the Queensland Hydro supervisor must consider the daily fire danger rating (FDR) and only issue permits in accordance with the FDR conditions detailed in Section 6.6.2.

Refer **Hot Works Procedure (HS-PRO-0016).**

5.2.2 Ignition from mobile plant/ vehicles

Plant / vehicles incorporating a heat engine in contact with, or within ten metres of bushland, grass, or other vegetation must:

- Be regularly cleared of debris in the undercarriage.
- Be regularly maintained to reduce likelihood of faults and mechanical defects that could cause a fire – e.g. be clean of surplus oil around surfaces heated by the exhaust/ motor.
- Be equipped with appropriate communication equipment, including UHF/ digital radios.
- Be fitted with an approved spark arrester.
- Carry fire suppression equipment. This equipment must be in working order and must be appropriate for the size of the plant/vehicle.

Exhaust systems from fixed plant (e.g. generator) must be directed away from flammable material.

There will be dedicated vehicle and plant parking areas which are in areas clear of vegetation. **Note:** New parking areas should only be created if there is approval to clear the vegetation in the location.

Workers must avoid driving on or parking vehicles on areas with long vegetation. This information will be included in Project inductions.

5.2.3 Ignition from Smoking

Smoking will only be permitted in designated smoking areas on the Project site. Designated smoking areas must:

- be clearly signposted.
- have a hard stand.
- have an acceptable receptable bin to place cigarette butts.

These requirements will be included in Project inductions and compliance to the same enforced.

5.2.4 Ignition from Arson

The following controls are to be in place to prevent unauthorised personnel entering Project sites:

- Access restrictions into worksite – such as fencing and locked gates.
- Security personnel manning Project access gates.
- CCTV.
- Signage advising that the Project site(s) are for authorised personnel only.

5.2.5 Ignition from Powerlines

Where power poles exist on the Project site (s), maintenance of vegetation breaks around power poles will be undertaken to 3m horizontal clearance from lines; vertical clearance 3m.

Whilst undertaking maintenance a visual inspection of poles is also to be undertaken to identify obvious areas of pole degradation or damage.

Note: Energex requirements for working near Energex assets are detailed here.

5.3 Site Design and Laydown Areas

The Project shall ensure all semi-permanent (e.g. site office compounds, camp accommodation) and permanent structures are located, wherever possible, in low-risk bushfire fuel areas (e.g. locate in grasslands rather than forests).

The perimeters of laydown pads and parking areas are to be clearly designated (and where practical fenced) to prevent outwards expansion into unmanaged areas.

Where possible perimeter roads/tracks should be incorporated around the outside of laydown pads, site offices and accommodation camps to:

- Provide access for emergency services.
- Prevent storage creep (outwards expansion of the storage areas).

Site layouts for semi-permanent and permanent structures must support the ongoing maintenance of asset protection zones – for example:

- Batters constructed in a way so that the slope can be mown or easily maintained as vegetation free areas.
- Asset protection zones are free from surface rock or debris that prevents their regular maintenance.

5.3.1 New Building Establishment

Construction will be in accordance with the *Building Code of Australia* and *AS3959:2018* (as updated) for all occupied buildings and all structures containing flammable materials or for storing explosives.

Explosives storage areas are to be designed/sited/managed to mitigate bushfire impact consistent with State Code 21 PO10, and where a BAL assessment indicates bushfire exposure, construction must comply with AS3959:2018 to the determined BAL (minimum BAL 12.5 where ember attack is credible).

Once constructed, site buildings are to be well-maintained for bushfire mitigation – e.g. ensure there is no build-up of vegetation in gutters or flammable materials lying around.

5.3.2 Material selection for temporary construction works

AS3959:2018 prescribes the construction details for buildings depending on the calculated Bushfire Attack Level (BAL). The detailed requirements relating to construction methods and materials are typically dealt with as part of building design and enabled via private certification in accordance with the Building Code of Australia.

Construction materials will be chosen that have a higher fire resistance rating, reducing the vulnerability of buildings to ignition.

5.4 Implementation and Maintenance of Asset Protection Zones

Asset Protection Zones (APZs) are cleared areas established around selected assets to improve their ability to withstand bushfire attack, by reducing the amount of available fuel; by providing defendable space and by managing heat intensities at the building surface.

APZs are to be implemented around semi-permanent and permanent structures that are determined through a formal BAL Assessment. The BAL assessment is to be undertaken prior to finalising the design for such structures, to determine how likely it will be to survive a bushfire and will be undertaken by Queensland Hydro's bushfire management consultant.

The APZ determination will also consider advice from Queensland Fire Department (QFD) as required and factors such as slope, structural elements, types of vegetation etc.

Once established the APZ is to be maintained as an area that is free of flammable material.The following minimum asset protection zones (APZ) must be maintained:

- a minimum 20m radius APZ around occupied accommodation buildings (or as per BAL report).
- a 10m APZ around:
  - all diesel generators.
  - non-accommodation buildings.
  - all other site infrastructure.

The following requirements must be met in relation to fuel load management:

- Non-habitable structures such as sheds/domes will be permitted in an APZ, as long as they are made from non-combustible materials and are located greater than 10m from any habitable building.
- Within the accommodation camp:
  - Garden beds with flammable plants are not to be located under trees and should be no closer than 10 metres from an exposed window or door.
  - Any planted trees should have lower limbs removed up to a height of 2 metres above the ground.
  - Plants should be arranged to minimise vertical and horizonal connectivity of plant material. Landscape trees should be spaced to avoid the foliage of mature trees overhanging roof lines and gutters.
  - Landscaping treatments within the APZ shall comprise only low threat vegetation, including lawn areas managed in a minimal fuel condition (i.e. ≤ 100 mm nominal height as specified in AS3959:2018) and species that are of low combustibility (i.e. species with high leaf moisture content, low volatile oil content, absence of shedding bark, low production of leaf litter etc.).
  - Mulches within any landscaped areas are to be non-combustible.
  - Regular maintenance should be undertaken to remove fine fuels and debris, particularly prior to and during the designated fire season window (September 1, unless declared earlier). This shall include regular vegetation management and maintenance where necessary and practicable (e.g. brush-cutting, weed removal etc.) and removal of debris and rubbish.

Note: APZ maintenance activities must follow all environmental approval requirements for vegetation removal.

5.4.1 APZs around Mobile plant and equipment in remote work sites

Where possible and practicable APZs should be implemented around all mobile plant and equipment used in bushland working sites i.e. areas outside of the laydown areas, site office compounds or designated camps. Examples of mobile plant and equipment that may be located in remote work sites includes:

- Portable tanks.
- Drill rigs.
- Earthmoving equipment not in use.
- Portable toilets.
- Pumps or generators.

The information in Table 1 below has been developed as a self-assessable tool to assist in determining fuel free and/ or reduced fuel zones.

Note: It is recognised that due to the topography of the Project site and other constraining factors, such as ensuring compliance with environmental approval conditions, it may not be possible to implement the distances recommended in the table below.

Where the recommended distances cannot be achieved Queensland Hydro will undertake a documented risk assessment to determine what alternative mitigation measures they will implement – for example, having a dedicated firefighting water supply at all times with the work group. Refer to Figure 2 for further examples.

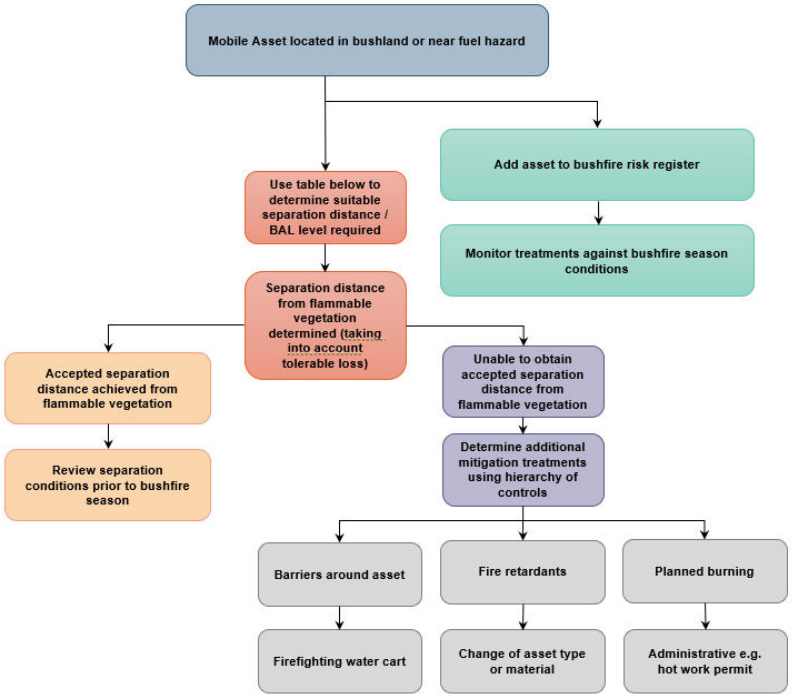


Figure 2 – Controls for mobile asset in remote areas

Mobile Plant Separation Distances from Vegetation - recommended requirements:												
Surrounding fuel type	**Flat ground**			**10 degree slope**			**15 degree slope**			**20 degree slope**		
	Flame length	**BAL 12.5**	**BAL 19**	**Flame length**	**BAL 12.5**	**BAL 19**	**Flame length**	**BAL 12.5**	**BAL 19**	**Flame length**	**BAL 12.5**	**BAL 19**
Grassland [1]	5.5m	15m	10m	7.5m	19m	13m	9.2m	22m	15m	10.9m	25m	18m
Open forest [2]	11.3m	37m	27m	18.6m	52m	39m	25m	63m	47m	34.2m	75m	58m

Table 1

Notes:

1. Grassland Calculations undertaken using:
    a. CSIRO Bushfire Attack Level Assessment Tool (Method 2 in AS3959:2009 Building in Bushfire Prone Areas).
    b. Predominant vegetation type: Grassland
    c. Forest Fire Danger Index: 50
2. Open Forest Calculations undertaken using:
    a. QFD SPP Bushfire Asset Protection Zone Width Calculator
    b. Vegetation Hazard Class – 9.1 Moist to dry eucalypt open forest on coastal ranges and lowlands.
    c. Forest Fire Danger index of 48 (5% AEP)

6. Preparedness Activities

6.1 Liaison with Queensland Fire Department (QFD) and other land management owners

Annually prior to the commencement of the bushfire season, Queensland Hydro will invite the local Rural Fire Service (RFS) brigades onsite for the purposes of site familiarisation and a review of the site fire response.

Project Emergency Response Plans will be provided to the Gympie and Somerset Local Disaster Management Groups and other local emergency response agencies.

Ongoing consultation with adjoining landowners regarding fire management strategies will be undertaken by the Queensland Hydro Environment, Lands and Construction teams.

6.2 Firefighting equipment

Where hot works are being undertaken, the work area must be equipped with appropriate fire-fighting equipment (as determined by risk assessment) to enable the work crew to immediately manage a small spot fire that is started by their works – e.g. fire extinguishers or a small water trailer with pump. Workers are to be trained in the use of this equipment.

During the designated fire season window (typically spring) vehicles travelling on unsealed tracks/ roads are to carry a fire extinguisher.

Refer to 7.1 regarding the Project Emergency Response Team and fire fighting response.

6.3 Training

All workers shall receive information in induction and on an ongoing basis in relation to the appropriate response to a bushfire on site, including evacuation procedures to be followed.

At a minimum the Queensland Hydro induction will include information on the following:

- how to avoid bushfire ignition.
- what to do in a bushfire.
- emergency and evacuation protocols.

6.4 Evacuation Plans and Designated Refuge Areas

The Project Emergency Response Plan details the Queensland Hydro evacuation plan, including assembly areas and emergency meeting points.

6.4.1 Designated Refuge Areas

During the exploratory works phase of the Project there will be no designated shelter in place refuge areas on the Project site. Any future designated shelter in place refuges must be compliant with *Design and Construction of Community Bushfire Refuges - The Australian Building Codes Board (ABCB), 2014*.

6.5 Preparatory Maintenance Activities

The following preparatory maintenance activities should be conducted prior to the start of and monthly throughout the designated fire season window (September, unless declared earlier):

- All APZs are maintained.
- All access/egress tracks regularly checked and kept clear of all obstructions and debris, to allow safe ingress and egress of personnel from the Project Site (s).
- All leaf litter and debris <6mm diameter cleared from gutters, garden beds, external decks and roofs.
- External walls, eaves and roofs are sealed and any window fly wires or screens are repaired – this will reduce the potential for ember attack.
- Adequate waste management practices implemented to prevent the accumulation of flammable materials on the site.
- Fire extinguishers serviced.

- Testing of fire hose reels and alarm systems conducted, where installed.

6.6 Fire Weather Monitoring and Fire Danger Ratings

The Project falls under the Wide Bay and Burnett region and borders the Southeast Coast region. QFD utilise Queensland Fire Danger Ratings (bom.gov.au) which are published by the Bureau of Meteorology (BOM) and are updated daily.

In addition, the Department of Environment and Science has installed smoke sensors at Cooroy and Gympie (the closest locations to the Project). These sensors provide local indicative measurements and health action advice during smoke and dust events. Live air data can be found at Live air data | Environment, land and water | Queensland Government (des.qld.gov.au).

Throughout any given day of the designated fire season window (September 1, unless declared earlier), workers on the Project are likely to be working in remote and isolated areas, where in the event of a bushfire, evacuation could prove challenging.

During the designated fire season window Queensland Hydro will nominate a member of the site Construction team to undertake the following activities daily:

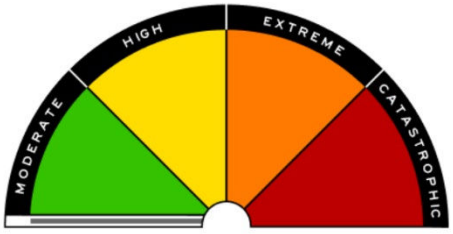
- Check for notice of a Total Fire Ban in the relevant fire areas.
- Check the fire danger rating (FDR) and live air data for smoke and dust levels for the site at or before 6am each day.
- Monitor fire danger weather warnings and change in weather conditions on the BoM website over the coming four days. Take note of forecasts for:
  - changes to FDR.
  - increases in wind or temperature.
  - reductions in humidity.
  - significant changes to wind direction or speed.
  - potential for lightning.
  - fires in the local area.
- Ensure the FDR and works fire preparedness colour code (refer 6.6.2 below) is communicated in daily prestart meetings to the workforce.
- Direct the implementation of the applicable fire preparedness works colour code actions.
- On adverse fire weather days (e.g. high winds), consistently throughout the day monitor the FDR and weather forecast.
- Consistently monitor for fire warnings and bushfire emergency alerts via the QLD Fires app.
- Notify personnel of any official emergency alert issued for the site (as required).
- Direct initiation of response actions when an emergency warning is issued as prescribed in Section 7.2.

6.6.1 Fire Danger Rating Boards

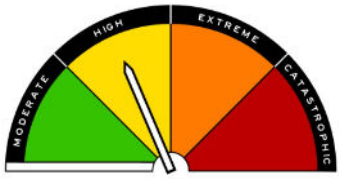
Electronic fire danger rating boards are in place at the Borgan and Yielo gatehouses and at the Granite Accommodation Camp. The boards are wifi enabled and provide live updates to the Project workforce of the FDR for the day.

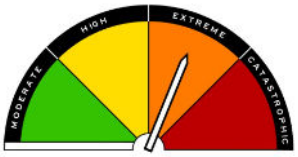
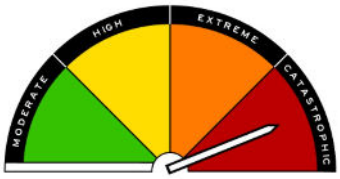
6.6.2 Works Fire Preparedness Colour Codes

Each fire danger rating (moderate, high, extreme, catastrophic) has been allocated a fire preparedness code, which mandates the minimum activities which must be undertaken to prepare for bushfire.



Fire Danger Level	Works Fire Preparedness Code	Fire Preparedness Requirements
Moderate 	**CODE GREEN**	▪ Works must be in accordance with standard H&S procedures, including compliance with Hot Works Permit conditions. ▪ FDR is checked for the day in accordance with Section 6.6. This check shall include considering the forecast FDR for the coming four days in programming work and in setting any work limitations. ▪ Personnel are notified of the FDR during pre-start. **Code Green work limitations:** ▪ None

Fire Danger Level	Works Fire Preparedness Code	Fire Preparedness Requirements
High 	**CODE YELLOW**	▪ Code Green preparedness requirements are implemented. ▪ Nominated person to maintain a 'listening watch' for fire warnings or changes to forecast weather as detailed in Section 6.6. ▪ At 12pm review of the FDR to occur – dependent on changes to FDR, consideration to be given to suspending hot works in hazardous and remote areas. ▪ A mobile water unit (min. 400L capacity) is present at each work location undertaking hot works with: ○ Tanks kept full ○ Pump fully fueled ○ Minimum pump unit 2.2kW/3HP ○ Minimum 60m of hose ○ Fill and outlet hoses with Storz fittings ○ Nozzle capable of fog and jet stream ○ Must be maintained in a fully serviceable condition ○ In the case of a towed mobile water unit, the towing vehicle must remain attached. ▪ There should be two operators trained in the use of the mobile water unit equipment at each location (minimum Wildfire Awareness Training). ▪ A fire watch person will monitor hot works activities. ▪ Haulage and other vehicle usage to occur on **formed tracks and access roads only.** **Code Yellow work limitations:** ▪ Hot works suspended by 12:00 or earlier if fire weather conditions deteriorate (e.g. wind picks up).

Fire Danger Level	Works Fire Preparedness Code	Fire Preparedness Requirements
Extreme  	**CODE ORANGE**	▪ Code Yellow preparedness requirements are implemented. ▪ Nominated person to undertake hourly monitoring of the FDR **Code Orange work limitations:** ▪ An assessment of safe egress options is to be undertaken for all works. Where safe egress options are limited (e.g. single track in and out) work is to be suspended. ▪ If a TOBAN is in place the restrictions in Section 6.6.3 apply. ▪ Consideration is given to leaving site early.
Catastrophic  ***Fires will spread quickly and be extremely dangerous***	**CODE RED**	▪ All of site to be evacuated. ▪ No works to be undertaken.

6.6.3 Total Fire Ban Actions (Code Black)

QFD may declare an area to have a total fire ban (TOBAN) when bushfire risk is elevated. A TOBAN helps limit the potential of fires developing by prohibiting the lighting, maintaining or use of a fire in the open, or the carrying out of any activity in the open that causes, or is likely to cause, a fire. Hot works will not be permitted during a TOBAN.

When QFD declare a Total Fire Ban (TOBAN) in the Wide Bay and Burnett region, the fire preparedness requirements detailed in the table below override those in the table above.

Fire Danger Rating	Works Fire Preparedness Code	Fire preparedness requirements
TOTAL FIRE BAN (TOBAN)	**CODE BLACK**	▪ Haulage and other vehicle usage occur on formed tracks and access roads only. ▪ All hot works are prohibited. ▪ TOBAN rules will be added to prestart sheets.

7 Response

7.1 Firefighting resources

During exploratory works Queensland Hydro will provide an onsite Emergency Response Team (ERT) who service the Project site (including areas under the management and control of other Principal Contractors). The ERT will comprise of suitably trained, competent and equipped ERT personnel, with personnel onsite available 24/7 to provide an initial response to bushfires/ grassfires started by Project work activities, pending arrival of professional emergency responders from local emergency response agencies. The ERT will have onsite a fire truck which will remain in the Yielo area (providing primary response to a fire in the camp) as well as a rapid deployment fire fighting vehicle which can travel on internal site tracks.

Note: the Project ERT are not permitted to provide a response to fires that occur/ are threatening other Queensland Hydro sites (e.g. Grasstrees, Oakwood). In all cases 000 is to be called to request assistance from the Rural Fire Service.

As there is no reticulated water supply on the Project site, bores and tanks will be the primary emergency water source. Creeks in the area may also be available for water usage depending on seasonal conditions and environmental approvals. Locations of water points will be reviewed annually. Water points will be signed on site and marked on operations maps. Current water points are:

- Borgan
- Fire fighting tanks in Granite Camp
- Water tanks located on tank farm track at CH650 5 x 22500ltr tanks

7.2 Actions following issuing of Emergency Alert

In the event of a bushfire emergency onsite, 000 is to be contacted immediately, followed by requesting the Project ERT to attend the area and notifying the Queensland Hydro Person in Charge.

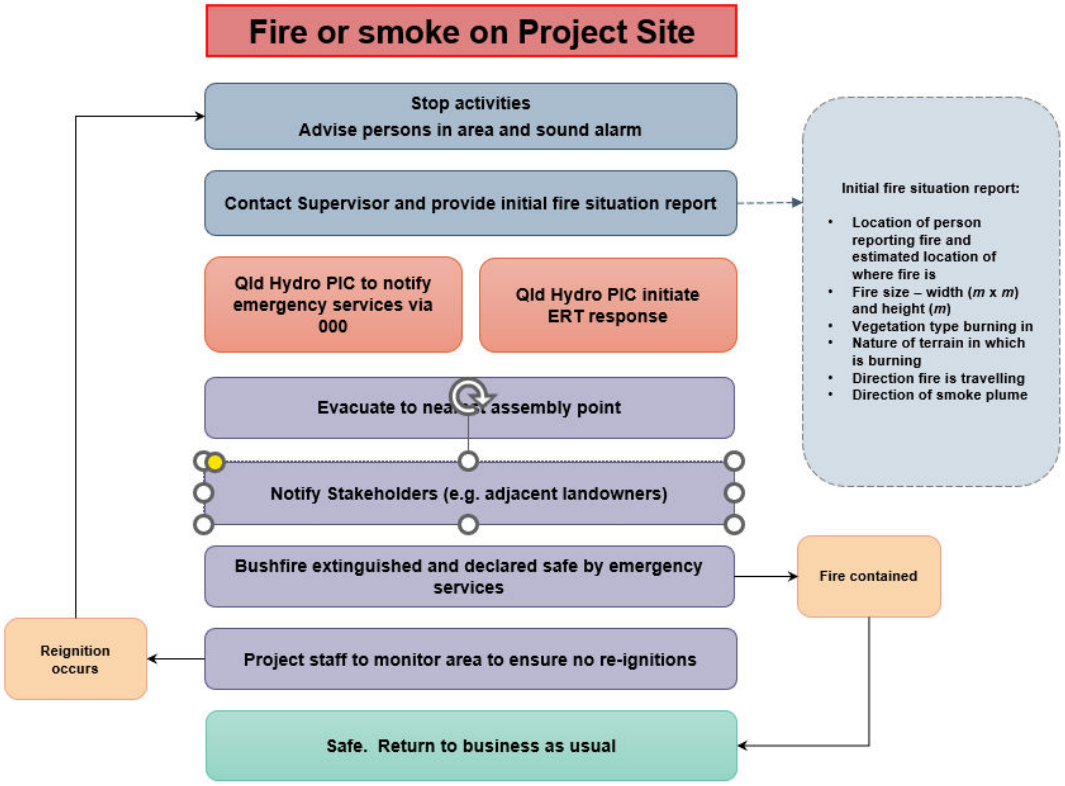
The table below provides an overview of the actions to be taken if QFD issue an emergency alert for bushfires which are in the vicinity of the Project site.

EMERGENCY ALERT		
ADVICE	**WATCH AND ACT**	**EMERGENCY WARNING**
A fire has started. There is no immediate danger but you need to stay informed in case the situation changes.	There's a heightened level of threat. Conditions are changing. Act now to protect yourself and others.	You're in danger and need to take life-saving action immediately. Any delay now puts your life at risk.
SITE ACTION		
Work can continue as normal. Queensland Hydro (PIC) to monitor the bushfire situation on QLD Fire App with support from ERT.	Consideration must be given to what work is safe to continue and what work must cease. Queensland Hydro (PIC) to determine any individuals deemed non-essential and initiate go early evacuation actions if safe.	Queensland Hydro (PIC) and Principal Contractors to work together to control and authorise evacuation of all personnel to offsite evacuation location, if safe and route is clear. Personnel cannot make decision to self-evacuate, as going into unknown fire conditions can be deadly. If offsite evacuation not safe, shelter in place on project site.

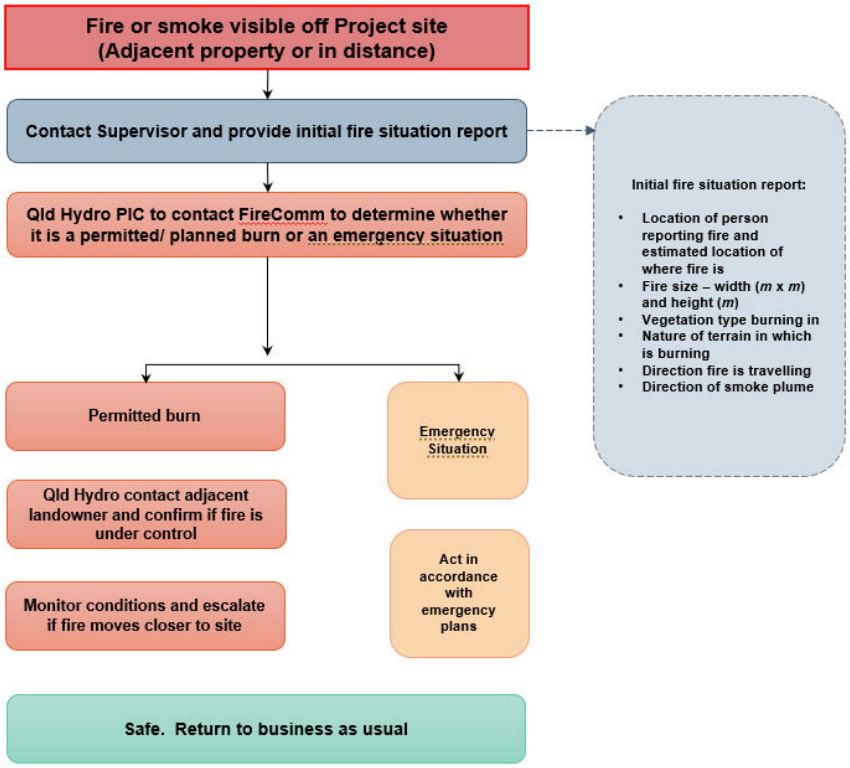
Note: All vehicle access routes through the Project site (s) and adjacent to the Project site (s) traverse bushfire prone vegetation which can support higher intensity bushfires. Attempting to evacuate at the last moment through these areas during a bushfire may be extremely dangerous, with fatal consequences.

In the event that evacuation of the Project site is needed, the Queensland Hydro Person in Charge (PIC) shall coordinate with all dependent contractors and Principal Contractors to manage the evacuation in consultation with the relevant Emergency Services Agency. Personnel should not self-evacuate and await further instructions unless in imminent danger.

7.3 Detection of fire or smoke on Project Site



7.4 Detection of fire/ smoke visible from Project Site



8 Recovery

8.1 Post Incident Action Plans

Where a bushfire has impacted the Project site(s) a post incident action plan will need to be developed. This plan will document any remedial actions required and may include:

- Rehabilitation of fire lines.
- Rehabilitation of significant ecological areas.
- Maintenance.
- Vegetation management (tree hazard/debris removal).
- Monitoring of weeds.
- Removal or repair of any damaged infrastructure or equipment.

8.2 Debriefs and Major Incident Reviews

Following a bushfire, a debrief will be conducted to identify learning opportunities and feedback to better inform future incident management. The debrief may include a review of the following:

- Acknowledge the response of all contributing organisations and individuals.
- Acquire constructive feedback from all involved on observations, insights and lessons.
- Identify where gaps exist in training and planning systems.
- Determine a course of action toward improving planning systems etc.
- Foster sound inter-agency/contractor communication.
- Identify a need for specific investigation of issues and further debriefing on an individual or organisational level.

The detail and scope of this debrief will vary dependent on the scale of the incident. At a minimum an internal debrief should be conducted and any broader areas identified be communicated with the external emergency response agencies.