

**HSEF0301.1 – Environmental Impact Assessment (EIA)****Approved by:** Head of Workplace Health and Safety**Revision:** 3**Date:** May 2019**Page** 1 of 7

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ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

PROJECT SITE/LOCATION	Tribute Power Scheme	ANTICIPATED DURATION OF PROJECT	2 months
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**DESCRIBE THE WORK
ACTIVITY AND WORK
ENVIRONMENT**

As part of the Battery of the Nation initiative Hydro Tasmania is undertaking feasibility assessments of a potential pumped hydroelectric scheme (PHES) associated with Lakes Plimsoll and Murchison, termed the Tribute PHES. A Tribute PHES would include new power and tailrace tunnels linking Lake Plimsoll and Lake Murchison as well as an underground power station and intake/outlet structures on each lake. Further information on the Battery of the Nation and planned Tribute PHES feasibility assessments can be found on Hydro Tasmania's [website](#).

A critical component of the feasibility assessment is geotechnical investigations. Geotechnical investigations will be undertaken in phases. Phase 1 Geotechnical investigations will be used to assess the suitability of the potential PHES site for construction of underground infrastructure.

A map showing the test pit and drill hole locations is provided in Annex 1. One proposed site (TR-BH01) is located within the Lukes Knob Regional Reserve on land managed by the Tasmanian Parks and Wildlife Service. The remaining sites are on land vested to Hydro Tasmania.

Drilling

Drill holes will be drilled to a depth of approximately 300m at TR- BH06 and 70m at TR-BH01. Each drill hole will be approximately 100mm in diameter. Core recovered from the drill holes will be analysed and removed from site. The drill hole will be either capped or grouted at the completion of drilling.

Drilling will used a rubber tracked mobile drill rig. The drill rig requires the ability to recover continuous core samples with low disturbance, in-situ testing (including packer/water pressure testing and stress testing) and backfilling with grout under artesian pressure (potentially). A typical track mounted drill rig is shown in **Figure 1**.

**Figure 1 Typical track mounted drill rig**

Water will be required to facilitate drilling. Water will be circulated from an onsite water tank to the drill hole and back to a series of two sumps each approximately 1.5m³. Sumps allow solids such as naturally occurring rock and organic matter (e.g. tree roots) to fall out of suspension. Whenever possible water will be drawn from the second sump and recirculated through the drill hole. However, where insufficient water is returned from the drill hole water will be supplemented from the on-site water tank. Up to a maximum of 15,000L of water per day is anticipated to be required. Water will be taken from nearby sources, nominally Lake Plimsoll and Lake Murchison, and transported to site using a water tanker. Overflow from the second sump (e.g. in the event of high rainfall) will be dissipated over land and not directed down existing drainage channels.

Where required, drilling additives may be used (e.g. to control high hole torque, lubricate drill strings or stabilise the hole). Drilling additives will be used only when required and will be biodegradable (e.g. drill muds such as Mudex or Mudlogic).

Drilling will require the clearance and levelling of a drill pad up to approximately 15m by 25m and sheeted using fine gravel (10-15mm). The size of the drill pad (and area of vegetation cleared) will be the minimum required to meet OH&S requirements. The drill pad will provide an all-weather work area and accommodate the drill rig, water truck as well as various drilling infrastructure including nine meter drill rods, transportable water tanks and light 4WD vehicles. Erosion control measures will be installed at the drill pad.

Test pitting

The test pit will be excavated to allow visual examination of the soil, logging, in-situ testing and sampling from the pit as required. Test pitting will require the excavation of a trench up to approximately 10m long 2.5m wide and 5m deep. Spoil will be stored temporarily next to the test pit. Test pits will be backfilled to existing ground level using excavated soil in the general order it was removed. Top soil will be stockpiled

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separately and used to cover the infilled trench. No test pit will be left uncovered overnight. A 25 tonne excavator to be used for test pitting. Including the trench, spoil stockpile and room for the excavator the potential work area for each test pit is approximately 20m by 20m.

Access tracks

Proposed test pits and drill holes have been located as close as possible to existing roads to reduce the need to create new access tracks. Access to both drill holes will require the establishment of a gravel track from the existing access road to the drill sites to provide safe and appropriate accessibility for heavy machinery and personnel. TR-BH01 will require only a short up to approximately 20m access track. Although TR-BH06 is also located close to the existing road the drill hole site is significantly higher than the road an up to approximately 50m access track will be required to effectively manage the grade. Neither existing road from which access tracks will be established is publically accessible by vehicle.

Test pitting will not require the establishment of sheeted access tracks. It is anticipated that the excavator will be 'walked' to the site with minimal disturbance.

The location of proposed access tracks is shown in Annex 1.

Rehabilitation

Drill pads and access tracks will be removed at the completion of geotechnical works and the disturbed sites rehabilitated. Rehabilitation will include the removal of sheeting gravel, reinstatement of natural contours, spreading of removed vegetation and, if required to aid revegetation, planting disturbed areas with local species suitable to the location.

PROJECT MANAGER

Joe Booth

EIA PREPARED BY

David Procter

FINAL COPY APPROVED BY

Ian Jones

SIGNATURE**DATE**

26/02/2020

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LEGAL ASSESSMENT*Does this activity require a permit or the requirement to notify a regulatory body?**Refer to HSEP0201 – Legal and Other Requirements Procedure for further information***Local Council/State Requirements**

- ☒ Council Development Planning/Building Permits
- ☒ Heritage Permits (Aboriginal/Cultural)
- ☐ Permit to Take Threatened Species
- ☐ Mining Lease or Licence
- ☐ Forest Practices Plan
- ☒ Reserve Activity Assessment (TWWHA and other reserves)
- ☐ Dam Works Permit
- ☐ Crown Land Works Authority
- ☒ Scientific Research Permit
- ☐ Environment Management Pollution Control Act Permit (Level 2 activities or other)

Commonwealth Requirements

- ☐ Referral under *Environmental Protection and Biodiversity Conservation Act 1999* for significant impacts on matters of National Environmental Significance

Further Advice

- ☐ Seek assistance with identifying applicable legal requirements and obligations from Subject Matter Experts including the Environment & Engagement and Legal Teams, if required

If any of the above are required, please describe requirements and attach a copy of the documents:

The proposed geotechnical works are exempt from the requirement to obtain a planning permit in accordance with the West Coast Planning Scheme under the *Land Use and Planning Approvals Act 1993*.

An ecological survey has been completed at the proposed geotechnical sites and did not identify the requirement to obtain a Permit to Take under the *Threatened Species Protection Act 1995* (Annex 2).

An Aboriginal and historic heritage survey has been completed at the proposed geotechnical sites and did not identify the requirement to obtain a permit to move or destroy any Aboriginal or historic heritage (Annex 3).

The proposed works are not subject to any other Local Council or State requirements and do not require referral under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*.

The works at TR-BH01 are located within the Lukes Knob Regional Reserve and require a Reserve Activity Assessment (RAA). Through consultation with the Tasmanian Parks and Wildlife Service (PWS) it has been determined that this EIA will be submitted to PWS prior to the commencement of work for assessment against the requirements of an RAA.

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WORKING WITHIN THE TASMANIAN WILDERNESS WORLD HERITAGE AREA (TWWHA) AND OTHER PWS RESERVES*Refer to HSEP0911 - Operations in the TWWHA for further information**Skip this section if the works are not within the TWWHA or other PWS reserves*

- **Maintenance work** in the TWWHA will require notification to Parks & Wildlife Services in the form of a cover letter (see *HSEP0911.1 - WHA Notification of Works*).
- **New work** in the TWWHA and other reserves may require the completion of a Parks & Wildlife Services *Reserve Activity Assessment*. Refer to a Subject Matter Expert within the Environment & Engagement Team for further advice.

What is the zoning of the land under the TWWHA Management Plan?

N/A

What is the Wilderness Quality Rating of the land?

N/A

What is the Reserve Category of the land?

Regional Reserve

Is the land vested in Hydro Tasmania?

No - TR-BH01

What distance are the works from a public road, designated walking track or other public access route (e.g. Franklin River)?

Approximately 60m - TR-BH01

LIFECYCLE CONSIDERATIONS*As an example - Does this activity have the opportunity to consider and influence more sustainable acquisition of raw materials, end of life treatment and final disposal of waste?***If yes, describe the considerations and how to influence these through proposed actions (please note a lifecycle assessment isn't required):** N/A

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Refer to [IBRM Operation Information](#) for further information regarding operational impacts including probability and impact (consequence).

Probability Table		
Description	Probability Range	Example Probability
7. Almost Certain	91% – 100%	Event is expected
6. Likely	61% – 90%	Event is likely to occur
5. Possible	21% – 60%	Event may occur, but not likely
4. Unlikely	6% – 20%	Event not expected
3. Rare	1% – 5%	Event extremely unlikely
2. Extremely Rare	< 1%	May only occur in extreme and exceptional circumstances

Probability	Impact (Consequence)					
	1.Insignificant	2.Minor	3.Moderate	4.Major	5.Extreme	6.Catastrophic
7. Almost Certain 91% - 100%	7	14	21	28	35	42
6. Likely 61% - 90%	6	12	18	24	30	36
5. Possible 21% - 60%	5	10	15	20	25	30
4. Unlikely 6% - 20%	4	8	12	16	20	24
3. Rare 1% - 5%	3	6	9	12	15	18
2. Extremely Rare <1%	2	4	6	8	10	12

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POTENTIAL HAZARD AND RISK	INHERENT RISK (probability x impact)	CONTROL MEASURES	RESIDUAL RISK (probability x impact)	PERSON WHO IS RESPONSIBLE FOR MANAGING THE CONTROL MEASURE	HOW OFTEN WILL THE CONTROL MEASURE BE CHECKED TO ENSURE IT IS IN PLACE & EFFECTIVE
LAND see <i>HSEP0913 Land Management Procedure</i> <input type="checkbox"/> N/A					
<input checked="" type="checkbox"/> Importation of gravel from a quarry <input checked="" type="checkbox"/> Air and noise quality / pollution <input checked="" type="checkbox"/> Land clearing and contamination <input checked="" type="checkbox"/> Storage of equipment and / or construction of site shed <input checked="" type="checkbox"/> Excavation <input type="checkbox"/> Noise from works of normal business hours					
Land clearing for access tracks, test pit and drill pad establishment leading to erosion and sedimentation	15 - Moderate	Erosion control measures will be installed to control surface water runoff and prevent the transport of sediments from test pits, drill holes, access tracks and drill pads. Sites will be established in a manner to minimise risk of erosion occurring including: <ul style="list-style-type: none">• All land disturbances will be confined to the minimum practicable area to maintain OH&S requirements to ensure that the minimum land area is exposed to erosion for the shortest possible time;• Surface water will be diverted around the drill pad using structures such as catch drains, silt fences or bunds; and• Any discharge of drilling fluids from above ground sumps shall be to vegetated land or removed from site.• Test pits will be reinstated as soon as sampling is completed and will not be left open overnight.• Drill holes will be either capped or grouted at the completion of sampling.	8 - minor	Hydro Tasmania site manager Hydro Tasmania environmental representative (six monthly monitoring)	Daily visual inspection of sediment control structures Six monthly monitoring of rehabilitation works.

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		<p>To prevent erosion from site drill hole, test pits, drill pads and access tracks will be rehabilitation as soon as works at each site are completed. Rehabilitation will include:</p> <ul style="list-style-type: none">• Drill holes – full or partial grout as required and cap with appropriate plug.• Test pits - Backfill with original materials in reverse order finishing with topsoil. Any excess spoil will be treated as waste and removed from site.• Drill pad, access tracks and other cleared areas –remove gravel, stabilise and cover cleared areas with vegetation removed during clearing and, where required to facilitate revegetation, local seed or seedlings appropriate to the location.• Where erosion is a particular problem, such as on steep slopes, sediment may be held in place by using geotextile fabric or jute mesh held down with steel pins. <p>Rehabilitated sites will be monitored six monthly and further work carried out, if required, to ensure rehabilitation has been successful.</p>			
Source and transport of gravel for access tracks impacting environment and amenity.	12 - moderate	Gravel for access tracks will be sourced from existing stockpiles or quarries from the closest available stockpile or quarry.	8 - minor	Hydro Tasmania site manager	Once – inspection of gravel source

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Noise emissions from drill rig and machinery impacting amenity of visitors	12 - moderate	Ensure that machinery used on site is fitted with the required exhaust and noise suppression systems and it is in manufacturers recommended operating condition. Vehicles and machinery will not be left running when not in use. Site working hours will typically be from 0730 – 1730 from Monday to Friday. Work outside these times shall only be undertaken with the approval of the Hydro Tasmania Site Supervisor.	8 - minor	Hydro Tasmania site manager	Daily – visual inspection of machinery.
Generation of excessive dust through project activities impacting amenity visitors.	5 – insignificant	The drill site and access track will be wetted or stabilised if excessive dust is generated. Vehicles and machinery travelling to the sites will maintain an appropriate speed to prevent excessive dust generation. Earth moving equipment will be cleaned prior to leaving site to prevent the tracking of soil on nearby roads.	3 – insignificant	Hydro Tasmania site manager	Daily visual inspection of dust generation
FLORA – LAND AND AQUATIC <input type="checkbox"/> N/A					
<input checked="" type="checkbox"/> Vegetation clearing <input checked="" type="checkbox"/> Threatened Species, Communities & Habitat nearby <input checked="" type="checkbox"/> Disturbance / removal of habitat <input checked="" type="checkbox"/> Weed and disease spread					
Clearance/disturbance of listed threatened flora and vegetation communities at test pit and drill hole sites or for the establishment of access track and drill pads.	20 - Major	An ecological survey has been completed at all test pit and drill hole sites (including access tracks and drill pads) (Annex 2). TR-TP01 is located in the TASVEG vegetation community western wet scrub (SWW), TR-BH01	8 - minor	Hydro Tasmania site manager	Once – visual inspection of site clearance



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		<p>is located in Western buttongrass moorland (MBW).) and TR-BH06 is located in <i>Nothofagus - Atherosperma</i> rainforest (RMT). None of these vegetation communities is listed under the NC Act.</p> <p>No flora species listed under listed under the <i>Threatened Species Protection Act 1995</i> or <i>Environmental Protection and Biodiversity Conservation Act 1999</i> have been recorded at the proposed sites and none are expected to be disturbed by the geotechnical works.</p> <p>There are numerous large mature <i>Nothofagus cunninghamii</i> trees located within the vicinity of TR-BH06 that have conservation value however, all are expected to be able to be avoided. No <i>Nothofagus cunninghamii</i> trees with a diameter at breast height (DBH) of greater than 50cm will be felled. No <i>Nothofagus cunninghamii</i> trees with a DBH of greater than 30cm will be felled unless absolutely required to safely operate the drill rig. Where smaller trees are felled care will be taken to avoid damage to surrounding vegetation.</p> <p>Pruning of overhanging vegetation may be required to safely operate the drill rig at the drill holes. At all times pruning rather than felling trees will be preferred to achieve safety requirements. Pruning will be kept to the minimum required to meet safety requirements.</p>			

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		<p>Cleared vegetation will be temporarily stockpiled adjacent to the drill pad and access track and will be spread back over the site to facilitate revegetation or, if the site it to remain in place, removed at the completion of works.</p> <p>Clearing of trees will be conducted to current forestry industry standards, including adequate safety protection for personnel and equipment.</p> <p>The works area will be clearly marked prior to the commencement of works and contractors will be made aware of the requirement to confine all disturbance to within the marked area.</p> <p>If it is determined at the time of the works that additional disturbance is required or that the site is not suitable an appropriately qualified ecologist will inspect the additional / alternative site. If threatened species are located the site will be relocated if possible. If not a permit to take application will be completed for the threatened species prior to the commencement of works.</p> <p>Vegetation clearance shall be kept to the minimum required to safely undertake the geotechnical works. Wherever possible vegetation will be trimmed rather than removed.</p>			
Introduction of weeds or dieses via importation of contaminated machinery or material.	10 - minor	<p>Drill holes and test pits will be backfilled with excavated material.</p> <p>Any imported material (e.g. gravel for drill pads and access roads) will be sourced from a location that is certified to be free of Phytophthora.</p>	8 - minor	Hydro Tasmania site manager	As required – visual inspection of Phytophthora compliance and vehicles and



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		Vehicles and equipment used for the geotechnical investigations will be clean prior to transport to the site and free of mud and dirt that could harbour weeds and diseases prior to commencing work at the site. Vehicles and equipment used for the geotechnical investigations to keep to designated tracks.			machinery entering site.
FAUNA – LAND AND AQUATIC <div><input checked="" type="checkbox"/> Threatened fauna <input checked="" type="checkbox"/> Injury / death of fauna (stranding, drowning) <input checked="" type="checkbox"/> Disturbance to spawning, nesting or breeding seasons <input checked="" type="checkbox"/> Disturbance to sensitive habitats <input type="checkbox"/> Pest Fish</div>					
Clearance and/or disturbance of listed threatened fauna habitat at drill hole site or for the establishment of access track and drill pads	20 - major	An ecological survey was completed at test pit and drill hole sites (including access tracks and drill pads). No fauna species (or habitat for fauna species) listed under the <i>Threatened Species Protection Act 1995</i> or <i>Environmental Protection and Biodiversity Conservation Act 1999</i> are expected to be disturbed by the geotechnical works.	8- minor	N/A	N/A
Disturbance of active wedge tailed eagle nests.	20 - major	There are no recorded wedgetailed eagle nests within 5 km of the works sites.	8 - minor	N/A	N/A
WATER QUALITY					

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<div><input type="checkbox"/> Changes in water quality for upstream/downstream users</div> <div><input type="checkbox"/> Disturbance of fish passages / breeding / migration</div> <div><input type="checkbox"/> Unnatural, extreme or long term changes to water levels or flows</div> <div><input type="checkbox"/> Rapid drawdowns</div> <div><input type="checkbox"/> Changes to recreational uses of water</div>					
HERITAGE <i>see HSEP0912 Cultural Heritage Management Procedure</i> <input type="checkbox"/> N/A					
<div><input type="checkbox"/> Impacts to Hydro Tasmania historic heritage</div> <div><input type="checkbox"/> Impacts to non-Hydro historic heritage</div> <div><input checked="" type="checkbox"/> Impacts to artefacts (including concealment by rising water levels following planned maintenance drawdown)</div> <div><input type="checkbox"/> High/Very High ranking on the HT Cultural Heritage Inventory</div> <div><input type="checkbox"/> Site listed on the National Heritage List, Tasmanian Heritage Register, Planning Scheme Heritage Code or external heritage database</div> <div><input type="checkbox"/> Site on the Tasmanian Aboriginal Heritage Register (AHR)</div>					
Disturbance of Aboriginal relics or sites due to test pit excavation or access track and drill pad establishment.	16 - major	<p>A survey for Aboriginal and historic heritage was completed by Gondwana Heritage Solutions (Greg Jackman), accompanied by an Aboriginal Heritage Officer (AHO) at all test pit and drill hole sites (including access tracks and drill pads) (Annex 3).</p> <p>There were no artefacts recorded in the vicinity of the proposed geotechnical sites.</p> <p>All ground disturbance will be minimised.</p> <p>If it is determined at the time of the works that additional disturbance is required or that the site is not suitable an appropriately qualified heritage expert will inspect the additional / alternative sites prior to the commencement of work.</p> <p>If the site is assessed as medium or high risk an alternative site will be found.</p>	8 - minor	Hydro Tasmania site manager	Inspection of recorded artefact protection – if required.

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		Ensure contractors/workers have access to, and understand, Aboriginal Heritage Tasmania's Unanticipated Discovery Plan (Annex 4). Any Aboriginal relics encountered during works will be reported immediately as per UDP protocols and Hydro Tasmania's Cultural Heritage Management Procedure (HSEP0912).			
Disturbance of historic heritage sites due to access track and drill pad establishment	15 – moderate	No historic heritage values were identified or anticipated at the drill hole location or access track.	5 - insignificant	N/A	N/A
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WASTE & RECYCLING <i>see HSEP0914 Waste Management Procedure</i> <input type="checkbox"/> N/A					
<div><input type="checkbox"/> Waste oil / Hydrocarbons</div> <div><input type="checkbox"/> Concrete slurry</div> <div><input checked="" type="checkbox"/> Excavation spoil</div> <div><input type="checkbox"/> Hazardous waste (e.g. PCB)</div> <div><input type="checkbox"/> Asbestos / Coal Tar Enamel (CTE) waste</div> <div><input checked="" type="checkbox"/> Construction waste</div> <div><input type="checkbox"/> Recycling opportunities including steel, paper/cardboard, plastics</div>					
Spoil from drilling and site clearance left on site.	5 - insignificant	If generated, excess spoil will be removed from site and disposed of in an appropriate location. Drill cuttings may be discharged to vegetated areas around the site away from watercourses. Larger volumes of drill cuttings (>2m ²) will be removed from site.	3 - insignificant	Hydro Tasmania site manager	Daily
Site waste from geotechnical works contaminates surrounding environment.	10 - minor	Animal proof general rubbish bins will be available on drilling site for the duration of the works. Portable toilets to be kept on site for duration of works. Rubbish generated during test pitting will be collected and removed from site. General waste and sewage will be disposed of at an approved location by the waste management supplier. It is the responsibility of the Drilling Contractor to ensure that all drilling related tools, equipment and rubbish is removed prior to rehabilitation commencing and that all drill hole collars, plugs or caps are clearly marked and communicated.	4 - insignificant	TBC	Daily – inspection of rubbish collection and site for rubbish.

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Contamination of surrounding land from drilling waste water		Install an above ground sump to collect and store waste water. Reuse sump water in preference to carting in water.			
HAZARDOUS SUBSTANCES & CHEMICAL MANAGEMENT <i>see HSEP0921 - Hazardous Chemical Management Procedure</i> <input type="checkbox"/> N/A					
<input checked="" type="checkbox"/> Hazardous substances storage <input checked="" type="checkbox"/> Fire risk <input checked="" type="checkbox"/> Oil / fuel spill to land, air and water <input checked="" type="checkbox"/> Land contamination <input type="checkbox"/> Transport of hazardous substances required <input checked="" type="checkbox"/> Waste					
Pollution of nearby land from release of drill slurry containing drilling additives	10 - minor	Drilling additives will only be used when absolutely required. All additives used will be biodegradable Safety Data Sheets (SDS) must be available onsite. Recommendations on the safe handling and storage of these substances must be followed.	5 - insignificant	TBC	
Contamination of nearby land from accidental spills (e.g. fuel or oils).	12 – moderate	Any hazardous materials (including hydrocarbons) stored onsite must be contained in a bund, away from watercourses, and in accordance with any relevant and applicable legislation, regulations or Australian Standard. Staff must be trained in the use of spill kits and associated equipment. Ensure any fuel or oil spills contained immediately.	6 - minor	TBC	

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Form variations to suit user, system / software constraints, legal requirements or corporate requirements are permissible, as long as the intent of the form is not compromised.

POTENTIAL HAZARD AND RISK	INHERENT RISK (probability x impact)	CONTROL MEASURES	RESIDUAL RISK (probability x impact)	PERSON WHO IS RESPONSIBLE FOR MANAGING THE CONTROL MEASURE	HOW OFTEN WILL THE CONTROL MEASURE BE CHECKED TO ENSURE IT IS IN PLACE & EFFECTIVE
		Oil and fuel spill kits adequate for the quantity and type of materials on site will be kept at each site. Any waste from oil spill clean ups will be double bagged, removed from site and disposed of at an appropriately licenced facility.			
Spark or heat from operation of machinery starts fire.	12 - major	Regular inspection of vehicles/machinery for defects likely to start a fire. Ensure separation of fuel supplies from machinery by suitable distance. Ensure vehicles/machinery are not left running unattended. Ensure fire extinguishers are kept on machinery and in vehicles.	6 - minor	TBC	Daily - vehicle and machinery check

STAKEHOLDER ENGAGEMENT*see WMS-FRM-060 Stakeholder Advice Checklist (found within the Works Management System)*

Has WMS-FRM-060 been completed?

☒ Yes ☐ No
If No, please complete

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Have any potential issues been identified?

☐ Yes ☒ No

If Yes, then as per the instructions on the form, please consult with the Engagement Team to confirm what, if any, additional stakeholder consultation should be completed prior, during and post the project.

PROJECT LEARNINGS*Lessons from the project to be completed during project and during the final review.*

Issue	Action/Resolution