# Underground fire prevention audit Site: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Date conducted:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| 1 Fire prevention plan |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 1.1 | The mine has prepared an underground fire prevention and control plan. |  |  |
| 1.2 | The plan has been developed through a process of risk assessment. |  |  |
| 1.3 | The plan describes the fire risks present at the mine. |  |  |
| 1.4 | The plan describes the methods by which the fire risks are managed. |  |  |
| 1.5 | There is a program for conducting fire emergency drills for underground employees. |  |  |

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| 2 Resource requirements |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 2.1 | Current fire fighting infrastructure and equipment is marked on an underground plan. |  |  |
| 2.2 | Underground communications equipment is marked on an underground plan. |  |  |
| 2.3 | Fresh air bases, refuge chambers and escape ways are marked on an underground plan. |  |  |
| 2.4 | Current ventilation circuits are marked on an underground plan. |  |  |
| 2.5 | Air doors, stoppings, fans, regulators and ventilating devices are marked on an underground plan. |  |  |
| 2.6 | The potential for ventilating air flow modifications, by means of primary fan operational adjustments, has been predetermined and documented. |  |  |
| 2.7 | There is an automated alarm system that can indicate the presence of an underground fire by monitoring the mine ventilating air exhaust. |  |  |
| 2.8 | There is a system in place to enable all persons working underground to be promptly accounted for in the event of an emergency. |  |  |
| 2.9 | A means of transporting fire fighting equipment underground is provided. |  |  |
| 2.10 | Mutual aid agreements are in place with other mines. |  |  |

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| 3 Personnel and training |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 3.1 | All underground personnel are instructed in how to use the emergency communications systems available. |  |  |
| 3.2 | All underground personnel are trained in how to respond to an outbreak of fire. |  |  |
| 3.3 | All underground personnel are trained in the evacuation procedures. |  |  |
| 3.4 | Training for underground mobile equipment operators includes awareness of the types of fires likely on mobile equipment and the methods used to control and fight them. |  |  |
| 3.5 | Training for underground fixed equipment operators includes awareness of the types of fires likely on fixed equipment and the methods used to control and fight them. |  |  |
| 3.6 | Only competent persons may use hot work equipment underground. |  |  |

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| 4 Flammable / combustible liquids and materials underground |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 4.1 | The District Inspector of Mines has been notified in writing of the location and details of each diesel fuel service and storage facility constructed underground. |  |  |
| 4.2 | Diesel fuel service and storage facilities are located underground such as to minimise the risk of hazards from that facility. |  |  |
| 4.3 | Diesel fuel service and storage facilities are constructed underground such as to minimise the risk of hazards from that facility. |  |  |
| 4.4 | Diesel fuel service and storage facilities located underground are ventilated such as to minimise the risk of hazards from that facility. |  |  |
| 4.5 | Diesel fuel service and storage facilities that are constructed underground conform to the relevant Australian Standards.Diesel fuel service and storage facilities that are constructed underground conform to the relevant Australian Standards. |  |  |
| 4.6 | Where diesel fuel is reticulated from the surface to underground storage facilities, static electricity build up, due to fluid flow, is prevented. |  |  |
| 4.7 | Only purpose-built clearly labelled containers, which do not leak, are used to transport diesel fuel underground. |  |  |
| 4.8 | Diesel tank storage facilities located underground are bunded with a capacity of 150% of the largest tank present. |  |  |
| 4.9 | The quantity of diesel fuel stored underground does not exceed that required for one week of work underground. |  |  |
| 4.10 | Flammable / combustible liquids and materials are stored and / or dispensed with 'no smoking', ‘no naked flame’ signs displayed. |  |  |
| 4.11 | Spill containment equipment is available at those locations where flammable / combustible liquids are dispensed and any spillage is immediately cleaned up. |  |  |
| 4.12 | Waste liquids and materials that are flammable / combustible are collected and removed to surface on a regular basis. |  |  |
| 4.13 | An automatic fixed fire suppression system is installed at each location where oils, fuels and lubricants are stored or dispensed underground. |  |  |
| 4.14 | Automatic fixed fire suppression systems can be manually operated from a safe location. |  |  |

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| 5 Underground mobile equipment |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 5.1 | Underground mobile equipment that is fuelled underground is fitted with “fast fill” type fuelling systems. |  |  |
| 5.2 | Each diesel engined unit that is used underground and is turbocharged or rated at 125 kW or more, and each loader or grader that is used underground, is equipped with an AFFF or FFFP fire suppression system with a minimum of 2 activators. |  |  |
| 5.3 | Remotely controlled underground mobile equipment is fitted with remote activation of the on board fire suppression system from the operator’s remote control unit. |  |  |
| 5.4 | Underground loading and hauling equipment is fitted with brake temperature indicators. |  |  |
| 5.5 | The pre-start check of underground mobile equipment includes an inspection for potential fire hazards. |  |  |
| 5.6 | There is a system in place for the regular inspection of underground mobile equipment for potential fire risks, by a competent person. |  |  |
| 5.7 | The scheduled service fire risk inspection includes a check of the integrity of fuel and hydraulic lines, the condition of electrical wiring, and the integrity of emergency shut down systems. |  |  |
| 5.8 | The scheduled service fire risk inspection includes a check of the integrity of the shielding of the fuel and oil hoses in the vicinity of the exhaust and turbo charger. |  |  |
| 5.9 | The scheduled service fire risk inspection includes a check of the battery installation for rigidity, tight terminal clamps, cleanliness, etc. |  |  |
| 5.10 | The scheduled service fire risk inspection includes a check of the fire suppression systems and extinguishers fitted to the item of underground mobile equipment. |  |  |

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| 6 Underground fixed mechanical installations |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 6.1 | Underground conveyor systems are monitored for abnormal operating conditions that could result in a fire. |  |  |
| 6.2 | Underground conveyor haulage ways have a fixed fire detection / suppression system installed that is designed for automatic operation and also has provision for manual operation. |  |  |
| 6.3 | Underground fixed equipment condition monitoring and fire detection / suppression systems are maintained. |  |  |
| 6.4 | Underground conveyor belts are of a flame resistant type. |  |  |
| 6.5 | Underground belt driven equipment e.g. pumps, is routinely checked for drive belt tightness. |  |  |
| 6.6 | Underground areas with fixed mechanical equipment installed and operating have appropriate portable fire extinguishers located in the intake airway. |  |  |

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| 7 Underground fixed electrical installations |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 7.1 | There are documented standards for the installation of electrical equipment and cables, such that damage by mobile equipment or from other types of impact, is prevented or minimised. |  |  |
| 7.2 | Underground oil filled electrical equipment installations are constructed so as to contain any leaks. |  |  |
| 7.3 | Only non-flammable coolants are used in underground electrical equipment installations. |  |  |
| 7.4 | Where underground fixed electrical installations are within fenced enclosures, appropriate portable fire extinguishers are located outside of the fence, in the intake airway. |  |  |
| 7.5 | Only non-flammable sprays are used in the maintenance and cleaning of underground electrical equipment. |  |  |

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| 8 Underground air compressors |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 8.1 | Stationary and skid mounted air compressors installed underground comply with AS 4297. |  |  |
| 8.2 | Air compressors used underground and driven by a diesel engine are liquid cooled. |  |  |
| 8.3 | Where an air compressor used underground is driven by a diesel engine, the engine is provided with an automatic fire suppression system. |  |  |
| 8.4 | Air compressors used underground are fitted with a heat sensor in the discharge port which will initiate an alarm and then shut down at 150 degrees Celsius. |  |  |
| 8.5 | Where an air compressor used underground is unattended, it is located in a return ventilation airway behind an air control device. |  |  |

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| 9 Underground workshops |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 9.1 | There are at least 2 clearly marked exits from each underground workshop. |  |  |
| 9.2 | Appropriate fire fighting appliances are provided in underground workshops. |  |  |
| 9.3 | Class dedicated storage cabinets are used to store the hazardous substances used in the workshop. |  |  |
| 9.4 | All compressed gas cylinders and associated equipment are checked for leaks. |  |  |

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| 10 Maintenance and operating procedures underground |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 10.1 | A hot work permit system is in place for all such work underground work not carried out in a workshop. |  |  |
| 10.2 | Maintenance procedures identify associated fire hazards. |  |  |
| 10.3 | Both mobile equipment and fixed fire suppression systems are tested and maintained in accordance with the manufacturer’s specifications. |  |  |
| 10.4 | There is an inspection and maintenance procedure for fire hydrants, extinguishers and signs. |  |  |
| 10.5 | Operating procedures require that a vehicle that experiences a flat tyre underground is then only driven a short distance to a location where a new tyre can be fitted. |  |  |
| 10.6 | Operating procedures require that trackless units are not left unattended unless the engine or power supply has been switched off. |  |  |

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