# Development of high headings underground audit Site: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

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| 1 Design of excavation |
| |  |  |  |  | | --- | --- | --- | --- | | **Point** | **Standard** | **Standard met** | **Comments** | | 1.1 | The purpose of the excavation has been established. |  |  | | 1.2 | A geotechnical assessment has been completed. |  |  | | 1.3 | Ventilation requirements have been established. |  |  | | 1.4 | Standards are set for the plan layouts. Intent |  |  | | 1.5 | A specific procedure is developed where an excavation will approach any likely dangerous accumulation of water, gas, mud etc. capable of inundating the workplace. |  |  | | 1.6 | A specific procedure is developed when an excavation will approach any other opening or workplace. |  |  | | 1.7 | Accountability during the established excavation planning procedure exists. |  |  | |
| 2 Drilling |
| |  |  |  |  | | --- | --- | --- | --- | | **Point** | **Standard** | **Standard met** | **Comments** | | 2.1 | A standard drilling pattern for the heading exists. |  |  | | 2.2 | A standard procedure for aligning the face (marking off) exists. |  |  | | 2.3 | A standard procedure for drilling the face exists. |  |  | | 2.4 | Drill Operators are trained in the standard procedure for drilling. |  |  | | 2.5 | The work quality of the drilling crew is regularly checked by management. |  |  | | 2.6 | The procedures are adhered to by the drilling crew. |  |  | |
| 3 Charging explosives |
| |  |  |  |  | | --- | --- | --- | --- | | **Point** | **Standard** | **Standard met** | **Comments** | | 3.1 | A written procedure for charging up exists. |  |  | | 3.2 | The procedure makes provision for minimising blast damage to back and sidewalls. |  |  | | 3.3 | A standard to minimise overbreak exists. |  |  | | 3.4 | Operators are trained in the standard procedure for charging. |  |  | | 3.5 | The work quality of the charge up crew is checked by management. |  |  | | 3.6 | The procedure is adhered to by the charge up crew. |  |  | |
| 4 Blasting practices |
| |  |  |  |  | | --- | --- | --- | --- | | **Point** | **Standard** | **Standard met** | **Comments** | | 4.1 | A written standard procedure for blasting exists. |  |  | | 4.2 | Operators are trained in the standard procedure for blasting. |  |  | | 4.3 | Compliance with blasting procedures is regularly checked by management. |  |  | | 4.4 | Personnel involved adhere to the blasting procedure. |  |  | | 4.5 | A written standard procedure for re-entry after blasting exists. |  |  | | 4.6 | Re-entry personnel are trained in the standard procedure. |  |  | | 4.7 | Compliance with re entry procedures is regularly checked by management. |  |  | | 4.8 | The re-entry procedure is adhered to by underground personnel. |  |  | |
| 5 Making safe |
| |  |  |  |  | | --- | --- | --- | --- | | **Point** | **Standard** | **Standard met** | **Comments** | | 5.1 | A written standard procedure for making the heading safe exists. |  |  | | 5.2 | The equipment and/or vehicles required by the procedure are available. |  |  | | 5.3 | Illumination of sufficient quality is provided for inspection of high work places. |  |  | | 5.4 | Personnel involved in making the heading safe are trained in the standard procedure. |  |  | | 5.5 | Compliance with making safe procedures is regularly checked by management. |  |  | | 5.6 | The procedure for making safe in high headings is adhered to by the personnel involved. |  |  | |
| 6 Loading out operations |
| |  |  |  |  | | --- | --- | --- | --- | | **Point** | **Standard** | **Standard met** | **Comments** | | 6.1 | There is a written standard procedure for face cleaning (mucking out). |  |  | | 6.2 | Personnel are trained in the standard procedure for loading operations. |  |  | | 6.3 | Compliance with load out procedures is regularly checked by management. |  |  | | 6.4 | The procedure is adhered to by the operators involved. |  |  | |
| 7 Ground assessment and support design |
| |  |  |  |  | | --- | --- | --- | --- | | **Point** | **Standard** | **Standard met** | **Comments** | | 7.1 | A geological assessment has been made at the planning stage of the excavation. |  |  | | 7.2 | Rock mass classification (RMC) has been carried out and results are available. |  |  | | 7.3 | Dimensions and geometry of the planned excavation have been considered in relation to the RMC and geology. |  |  | | 7.4 | The range of dimensions of potentially unstable rock blocks is determined. |  |  | | 7.5 | The type of support appropriate to the identified conditions is established. |  |  | | 7.6 | Length and orientation of support elements are specified. |  |  | | 7.7 | Maximum and minimum spacing of support elements are identified. |  |  | | 7.8 | Ground support and/or surface protection is designed to contain side wall failure. |  |  | | 7.9 | The hazard of potential deterioration of support elements has been identified. |  |  | | 7.10 | The method and frequency of support testing is determined at the design stage, including testing of shotcrete where used. |  |  | |
| 8 Ground support installation |
| |  |  |  |  | | --- | --- | --- | --- | | **Point** | **Standard** | **Standard met** | **Comments** | | 8.1 | There is a written standard procedure for installing support in high headings at the mine. |  |  | | 8.2 | The equipment and/or vehicles required by the procedure are available. |  |  | | 8.3 | Operators are trained in the standard procedure for installing ground support. |  |  | | 8.4 | Compliance with the ground support installation procedures is regularly checked by management. |  |  | | 8.5 | The procedure for installing support in high headings is adhered to by the operators involved. |  |  | | 8.6 | Testing of support is carried out on a systematic basis as required by the design and a record is kept. |  |  | |
| 9 High headings lifetime management |
| |  |  |  |  | | --- | --- | --- | --- | | **Point** | **Standard** | **Standard met** | **Comments** | | 9.1 | A procedure exists for the post development inspection of high headings, both active and inactive. |  |  | | 9.2 | The equipment and/or vehicles required by the procedure are available. |  |  | | 9.3 | Operators are trained in the standard procedure for the post development inspection of high headings. |  |  | | 9.4 | A maximum time period between inspections is defined. |  |  | | 9.5 | A means of recording the inspection results is provided. |  |  | | 9.6 | Inspection records are countersigned and dated by the Underground Manager or appropriate nominee. |  |  | | 9.7 | A scaling programme is established based on the inspection findings in areas where mesh, shotcrete or other lining protection is not installed. |  |  | | 9.8 | A maintenance repair programme is established where the inspection findings identify deterioration in the installed roadway excavation lining. |  |  | |