0374 – 939

REPORT ON PLANS FOR THE DEVELOPMENT

OF

THE BOLD HEAD MINE,

NEAR GRASSY, KING ISLAND, TASMANIA.

ABSTRACT

The Bold Head Scheelite deposit consists of five major shallow dipping lenses containing approximately 2.8 million tonnes of 0.8% WO_3 scheelite ore. The deposit is to be developed by means of a main decline with strike crosscuts providing access to the orebodies on a panel system. Exhaust ventilation and second means of egress will be via a 4.0m. diameter lined ventilation shaft, situated to the north-west of the orebodies in granite.

A combination of stoping methods - pillar and stall, cut and fill, short wall advance, shrinkage - are under consideration for the extraction of different sections of the orebodies.

Operational services - electricity, water, compressed air, roads, drainage - are to be extended from the present open cut facilities and/or installed on site. Mine offices, change house and other facilities necessary for underground work are also to be established.

July, 1972.

King Island Scheelite Ltd.
(A Member of the Peko-Wallsend Group)

1. INTRODUCTION

This report is presented so as to describe the work now completed and the proposals envisaged for further progress on this project.

2. HISTORY

The Bold Head scheelite deposits were discovered by King Island Scheelite (1947) Ltd. in 1969. In that year Peko-Wallsend Ltd. took control of the operating company, which in 1971 became King Island Scheelite Ltd.

The exploration arm of Peko-Wallsend Ltd., Geopeko Ltd., continued exploration of the area. In 1971 seventy-three diamond drill holes had been completed and surface drilling was discontinued.

Five major lenses containing 2,800,000 tonnes of scheelite ore with an average grade of 0.81% WO_3 were outlined with a cut-off of 0.25% WO_3.

Proposals for mining were initiated in 1970. Studies were initially on an open cut approach, but these were found to be impracticable and uneconomic due to the high overburden ratio.

Underground mining studies were accelerated in 1971. A decision to adopt a trackless decline approach in preference to a twin shaft layout was taken late in 1971.

Authorisation to proceed with the project was given in February 1972. Mining of the box cut for the decline began on the 28th March, 1972; preparation of surface facilities and ordering of equipment was initiated at the same time.

It was hoped to begin tunnelling in late July, but serious breakdowns in shipping caused delays, which have now put back tunnelling by some seven weeks.

3. GEOLOGY

The orebodies are controlled by a major fault on the eastern boundary, and terminated by an intrusive granitic body to the west and north-west and at depth. The orebodies thin to the south and appear to become uneconomic in thickness and grade. (See fig. 6)

The individual lenses vary in thickness from one to thirty metres in five major lenses. There are several isolated smaller lenses, most of which appear to justify mining. The orebodies themselves are conformable with the strata and dip some 15° - 20° to the south-east. Steeping of the orebodies is exhibited against the granite contacts. Local thickening is present against the main fault on the east side, where a block of quartzite is up-thrown. Low grade molybdenite mineralisation has been encountered in the quartzites

The enclosing rocks consist of a broadly conformable series of meta volcanics, limestone, skarns and hornfels. Weathering is present to some 5-6 metres below clay cover, which is in turn some 10-12 metres thick.

Both "A" and "B" lenses outcrop and are weathered at the outcrop. The amount of sub-micron material in the outcrop ore presently makes treatment uneconomic.

The scheelite values show great variability with thin intersections giving values of over 7% WO_3. However the average values of each of the major lenses are in the range 0.8% WO_3.

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4. PROPOSED MINE DEVELOPMENT

Following a series of studies and comparisons of shaft versus decline access the latter has been selected as most suited to the geological situation, production requirements and existing labour force expertise. The erratic nature of the orebodies requires that the maximum degree of production flexibility be maintained, and whilst it is anticipated that certain sections of the deposit will require the use of scrapers for ore extraction, the desired degree of flexibility can best be maintained by making maximum possible use of mobile diesel equipment. Stoping and development layouts will therefore be oriented towards implementation of this approach.

4.1 Main Access

The proposed means of primary access to the orebodies is a 1 in 10 decline, which is to be driven in quartzites lying to the east of the orebodies, from a portal position of 566,650N 220,120E and an R.L. of +82 metres. (Figure 1.) In addition to its function of providing initial access, the decline will serve as the main haulage-way and intake airway.

Decline dimensions are shown in Figure 4, together with the proposed arrangement of ventilation, compressed air and water services. During the course of decline development an overlap exhaust ventilation system using 40 inch - 60 h.p. Richardson fans in series, will be employed, with a 25 h.p. forcing fan taking air to the face.

A combination of support methods are proposed - ranging from pattern rock bolting where minimal support is required, through to shotcreting and steel sets in poor ground conditions. Poorer ground conditions are most likely to be encountered in the initial 400 metres of decline which passes through strongly jointed volcanics. Relatively good conditions are expected in the quartzites.

Equipment to be used in the course of decline development includes:-

(i) Drilling Jumbo - Atlas Copco Boomer 3H - a three boom unit with telescopic feeds, the prime mover is powered by a 78 h.p. Deutz diesel motor, the unit is equipped with COP 90 ED rock drills.

(ii) L.H.D. Units - Cat.980B F.E.L. - two units, modified for use underground are purchased, initially to cover the complete load-haul-dump cycle, and later as tramming distance increases beyond the limits of effective double handling in conjunction with:-

(iii) Underground Haulage Units - K250 35 tonne capacity Kiruna trucks have been selected and ordered.

(iv) Shotcrete Machine - an Eimco Model CH wet mix machine capable of 4½ cu.yds./hour has been selected.

(v) Service Vehicles - Units to cover initial requirements for personnel and materials transport, decline service activities are:-

(a) Two International D1310 4 wheel drive trucks both fitted with 131 h.p. diesel engines and modified for use underground as:-
  (i) personnel carrier,
  (ii) drill steels and materials carrier.

(b) Two Fiat tractors 50 h.p. diesel engines and modified for use underground as:
  (i) Scaling/charging vehicles with front mounted fork lift type platform.
  (ii) Explosives vehicle with rear mounted box platform and fixed platform over engine.

(c) Two trailers:
  (i) for transport of shotcrete aggregate,
  (ii) fitted with hydraulic lift for installation of vent ducting and pipes.

These items are to be prepared for underground use by Bass Engineering Ltd., Burnie.

4.2 Main Ventilation Return

The main ventilation exhaust will be situated to the west of the orebody in a granite intrusive (Figure 1 Co-ords. 567,210N 220,035E). It is proposed to raise and strip the shaft to 4 metres diameter (inside lining) in several vertical lifts from the A, B and C vent return x-cuts as these are established.

Collar R.L. of the vent shaft will be approximately 108 metres above datum giving an initial lift from the "A" lens ventilation return of approximately 60 metres. The shaft will be kept in granites for its full depth, although lower lifts may be offset towards the east to shorten the length of lower ventilation x-cuts returns. It will be equipped with a ladderway of suitable design to provide an alternative means of exit from the Mine.

A detailed analysis of final air flow requirements has not yet been completed but provisional studies indicate that requirements will be of the order of 200,000 c.f.m. at a Mine resistance of 6 inches Water Gauge.

4.3 Orebody Access

Access to the individual lenses, from the main decline will be by means of strike drives at intervals of approximately 60 metres. So far as flexures in the individual lenses will allow, strike crosscuts will be kept in or just below the footwall of the orebody. These x-cuts will range in length from 100 metres in "A" lens up to 200 metres in "B" and "C" lenses. Appropriately situated strike drives will be extended to the vent shaft as return airways, the remaining x-cuts being interconnected to these return airways by means of inclined drives/rises along the western boundaries of the orebodies.

5. STOPING METHODS

Investigations and design work to date have centred on maximum utilisation of (1) the underground exploratory/service layout provided by the panel system of strike x-cuts and on (2) mobile diesel equipment. It is apparent that the variable nature of individual lenses will necessitate the introduction of several different stoping systems. Attention has been confined principally to "A" and "B" lenses, which will be the first developed and the initial production source.

5.1 "A" Lens

The complexity of "A" lens is shown in Figure 5. Model studies indicate that it will be necessary to employ three or four different methods - viz.:-

(i) For the thinner and flatter dipping parts of the lens a pillar and stall method is proposed - leaving low grade pillars as natural support.

(ii) For thin but steep dipping parts, a short wall stoping method using slushers to bring broken ore to loading points along the strike x-cuts is suggested - this would require that either rib pillars be left or a system of back fill be introduced.

(iii) In thicker areas a top slicing and benching method can be adopted. - In such situations an extraction drive with draw-points will be established under or within the footwall of the orebody.

5.2 "B" Lens

"B" lens is comparatively regular in thickness and dip, although still subject to a degree of splitting. It is considered that dips are generally within the gradeability of rubber tyred equipment, and:-

(i) initially a pillar and stall system will be employed;

(ii) later pillar extraction will be considered in conjunction with post filling;

(iii) in the few areas where thickness exceeds, say, 6 metres the stoping blocks will be mined in two lifts - the initial stope extraction following the hanging wall with subsequent benching out after the hanging wall has been secured. A schematic layout for situations (ii) shown in Figure 7.

5.3 "C" Lens

Similar dips and splitting characteristics are indicated for "C" lens, although thicknesses are somewhat greater. It is provisionally intended to use a similar combination of methods to those envisaged for "B" lens. A third method is being evaluated using hanging wall drives on dip, and ring drilling to take out long stopes between pillars. Post-cemented fill will then be introduced.

A complication is introduced with divided lenses. Where the intervening waste band is relatively thin it is proposed to extract the upper lens first and secure the roof with roof bolts. The waste band would then be mined and used as back fill. Finally the lower lens would be benched out and the void back-filled.

Where the waste bands are thicker separate working will be necessary.

6. VENTILATION

The main circuit ventilation will be down-cast via the decline and up-cast via the 4.0m. circular ventilation shafts.

Splitting of the air flow will take place from each of the main strike drives into the various stoping areas. Exhaust air will be directed to the western side of the orebodies into an up-cast drive in ore. This will then exhaust into the main exhaust return to the vertical shaft to surface.

Ventilation requirements are estimated as 200,000 c.f.m. with a mine resistance of 6 in. W.G. at the maximum resistance.

The main fan would be situated at the top of the ventilation shaft. Details are not yet to hand, but it would appear that Richardsons would be favoured.

Secondary ventilation and development ventilation would be by means of smaller electric fans and ducting. Rigid ducting would be used for long distances and flexible for short distances. Main development would be as described for the decline development.

Additional down-cast ventilation will be provided by means of raises to surface through the crown pillars on the sub-outcrop of "A" and "B" lenses.

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7. SUPPORT

No major problem is anticipated. It is expected that the decline will require steel sets near the portal. This will be replaced by shotcreting and/or roof bolting as rock conditions improve.

Some support using arches may be required where the main strike drives cut through the main fault. The granite contact has areas of marked alteration and strong support may be required locally. Natural support from pillars and rock bolting will be relied upon for support in the working stopes using the Pillar and Stall system.

In cut and fill areas the standard approach will be top slicing so as to expose the full width of the stope. The roof will be bolted. Development waste will be utilised for fill and later hydraulic fill will be required with cement addition for subsequent consolidation. Pillars can then be mined out.

The adoption of Pillar and Stall stoping will enable some years production to be carried out before a sand fill plant is required. The use of rock fill will also be examined.

8. SAFETY

8.1 Water Inflow

The only areas where water inflows are suspected are on the granite contact and the main fault. Long holes will be put out ahead of workings approaching these areas.

8.2 Roof Falls

Various systems of support will be used to secure ground. A vehicle with a hydraulic platform will assist in checking backs in all workings. Hydraulic jacking sets will be available as rescue equipment.

8.3 Fire and Gases

All diesel units will be equipped with fire extinguishers and also approved extinguishers will be available in areas with electrical apparatus. There will be virtually no timber in the mine, which will reduce the fire hazard. All persons underground will be issued with self rescue sets giving 45 minutes supply of air. Regular monitoring of diesel exhausts and oxygen content of the air will be carried out and testing of other gases according to Regulations. Additional escape routes will be available via raises on the sub-outcrop of "A" and "B" lenses.

8.4 First Aid

Fully equipped first aid stations will be created as required by extension of the workings. It is intended that all foremen shall be holders of a first aid ticket.

8.5 Dust Control

Konimeter monitoring will be carried out regularly and as required by Regulations.

8.6 Illumination

All electrical installation, main pump stations and congested areas will be suitably illuminated. Lights will be installed in the main decline.

8.7 Noise Suppression

All persons underground will be issued with ear muffs and required to wear the same. Attention is directed to muffled drills and general noise suppression. Equipment for measurement of noise levels is on hand.

8.8 Rescue Team

It is intended to build up a regular trained rescue team as the personnel become more experienced. Breathing sets will be on hand and men trained in their use.

9. OPERATIONAL SERVICES

9.1 Electrical Distribution

9.1.1 Scope

9.1.1.1 Power for Bold Head underground mining operations and associated surface installations is supplied from the 3,300 V. H.V. Distribution Board situated in the new 8.4 M.W. Bold Head Power Station.

9.1.1.2 The magnitude of available power for the total mining operations is 2500 k.v.a. and is supplied at pressures of 6600 V., 3300 V. and 415V. at appropriate locations.

9.2.1 Transmission

9.1.2.1 The power is taken from the 3.3 K.V. power station board by 11K.V. 195m.m.^{2} 3 core P.I.L.C. aluminium power cable, which is connected to the primary winding of a 3300V./6600V. Δ/Y direct earthed neutral step up 2500 k.v.a. power transformer situated in the transformer yard 30 metres distant from the power station. The transformer neutral is connected to a 2.44m. x 1.2m. x 7m.m. copper plate electrode buried edge and with the plate centre at 2.13m. between ground level by green P.V.C. sheathed 160m.m.^{2} copper conductor.

9.1.2.2 The transformer secondary is connected to a pole mounted 200A capacity rocker air break switch-fuse (drop-out) combination by way of identical power cable described in 9.1.2.1. The pole is within the transformer perimeter yard.

9.1.2.3 Connection between the pole mounted Rocker air break switch-fuse combination mounted some 7.5m. above ground level and the 6/1/.132 P.V.C. covered aerial line conductors is by 65m.m.^{2} 11K.V. single core drop wire.

9.1.2.4 The overhead 2500 k.v.a. capacity 6600V. power line connecting the power station transformer yard and the Bold Head compressor house sub-station is 1035m. in length utilising 6/1/.132 P.V.C. covered S.C.A. conductor mounted in delta formation 10.36m. above ground level and supported on 12.19m. wooden poles spaced at an average of 122m. intervals. The line conductors are tensioned to 907kg. and are spaced at 1.65m. centres on the lower outer conductors.

9.1.2.5 Support pole crossarms are galvanised channel iron 12.7cm. x 6.35cm. which are solidly earthed at each pole by 15mm. green P.V.C. covered copper conductor connected to 250cm. x 1.27cm. diameter steel tipped copper electrodes driven full depth into the ground at the base of the pole.

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9.1.3 Compressor House Sub-Station

9.1.3.1 The terminating pole at the sub-station which is within the boundary 2.5m. high triple stranded barbed wire topped fence of the 7.93m. x 7.48m. sub-station yard carries a pole top 400A. 11K.V. horizontal down rod operated air break switch and a down rod operated vertical mounted 200A. capacity Rocker air break switch-fuse combination mounted 4.5m. above ground level to which a P.I.L.C. 11K.V. 3C. 195mm.^{2} aluminium power cable is connected which carries the power to the outdoor 2100k.v.a. 6600V./3300V./415V. Δ/Y/Y step down power transformer situated on a concrete pad centre of the sub-station.

9.1.3.2 415V. power of up to 900 k.v.a. capacity is taken from the sub-station power transformer into the compressor house free standing dead front power distribution board by 2 off 390mm.^{2} aluminium conductors per phase and 1 off 390mm.^{2} conductor for the neutral all conductors enclosed in an outdoor steel trunking painted 557 light orange which is solidly fixed to the top of the power distribution board.

9.1.4 Compressor House Distribution Board

9.1.4.1 The Compressor House/sub-station 415V./240V. free standing cubicle type power distribution board consists of a 1200A. incoming A.C.B. which transfers power to (2) 500A. C.F.S. units suitably fused for power supply to an auto transformer starter cubicle controlling a 300 h.p. 1200 c.f.m. compressor and a power distribution board known as the "Portal Power Supply" board situated some 140m. from the compressor house board.

9.1.4.2 Apparatus within and nearby the compressor house apart from the main compressor is controlled by circuit breakers comprising a circuit breaker panel in the compressor house distribution board.

9.1.5 Sub-Station/Compressor House Earthing

9.1.5.1 The 6600V. and 3300V. equipment earthing in the compressor house sub-station yard is by 8 off 250cm. x 1.27cm. diameter steel tipped copper electrodes suitably spaced and driven full depth into the ground within the boundary of the switchyard enclosure.

9.1.5.2 415V. (transformer star point) earthing is a copper plate electrode 2.44m. x 1.2m. x 7mm. thick buried edge on at a depth of 2.13m. to plate centre some 2m. from the switchyard fence and connected to the transformer neutral by green P.V.C. covered 160mm.^{2} copper conductor and 50mm. x 6.35mm. buried copper bar.

9.1.6 Portal Power Supply - Distribution

9.1.6.1 The Portal power supply distribution board is connected to a supply C.F.S. unit in the compressor house distribution cubicle by approx. 140m. of 4 x single core 195mm.^{2} R.-BL-85 aluminium conductors and one 40mm.^{2} earthing conductor enclosed in 10.16cm. diameter class A. P.V.C. conduit buried at an average depth of 2m. in a marked table trench.

9.1.6.2 The 195mm.^{2} conductors terminate into a 300A weatherproof C.F.S. unit bolted to the side of the portal distribution board which acts as a fused isolator for the board bus bar supply to which distribution circuit breakers are connected.

9.1.6.3 The distribution circuit breakers control welding, lighting, vent fan and pump motor starters which are in turn fitted with Westinghouse core balance earth leakage units.

9.1.7 Service Bay Power Supply - Distribution

9.1.7.1 The service bay sub-board is a wall mounted flush panel double hinged steel enclosure containing both circuit breakers and H.R.C. cartridge fuse gear for both single and polyphase equipment such as lighting, steam cleaning equipment and fuel pumps, with the pump contactors connected to the board circuit breakers. All circuits containing contactors incorporate Westinghouse cone balance earth leakage units.

9.1.7.2 The service bay board power supply is taken from the Portal distribution board by way of circuit breaker switched sub mains of 4 core & ECC 40mm.^{2} R-BL-85 600V. rated cable enclosed in 3" class A. P.V.C. conduit buried at a depth of 1½ metres (AV.)

9.1.8 Distribution Board Earthing

9.1.8.1 The earthing system for the whole installation is M.E.N. with the main earth at the compressor house sub-station transformer neutral (see section 9.1.5).

9.1.8.2 Additional electrode earths made by steel tipped 250cm.x 1.27cm. diameter copper electrodes fully driven are connected to both the portal and service bay board earth links and board frames. Earthing conductors are banded as a continuous system with independent parallel earths at the distribution boards.

9.1.8.3 The earthing resistance of the main plate electrode is 0.57Ω and insulation resistance 4 MΩ has been attained at the lowest test readings.

9.1.9 Underground Power Supply

9.1.9.1 The main underground power supply is taken from the 1200 k.v.a. 3300V. tapping of the dual secondary winding of the compressor house sub-station 2100 k.v.a. transformer.

9.1.9.2 Power is taken from the transformer to a pole mounted 200A. capacity Rocker air break switch-fuse combination mounted some 7.6 metres above ground level on the O.H. line take off pole within the compressor house sub-station yard by 3 C 11K.V. 40mm.^{2} P.I.L.C. power cable and connected to a short 170m. O.H. power line of similar construction as described in Section 9.1.2.4.

9.1.9.3 The power is carried underground approx. 70m. depth by 3 C 11K.V. 40mm.^{2} P.I.L.C.S.W.A.S. power cable which is taken from the terminal point of the overhead conductors by use of a 200A. capacity rocker air break switch-fuse combination of down rod operation. The power cable is clamp suspended as detailed in K.I.S. drawing 3-E-009 on the surface and suspended down the bore hole access by S.S. wire rope and wire rope clamps.

9.1.9.4 The suspended end of the 3 C 11K.V. 40mm.^{2} P.I.L.C.S.W.A.S. power cable is terminated into a sled mounted oil filled 300 k.v.a. 3300V./415V. Δ/Y power transformer close coupled to a power distribution switchgear cubicle as described in the attached KIS specification BH2 of June 1972 and KIS drawing No. 3-C-013. Earthing is continuous to the underground switchgear from a plate electrode installed within the underground power take off and switching pole enclosure.

9.1.10 Ventilation Shaft

9.1.10.1 Power supply to the ventilation shaft is transmitted by a 6600V. O.H. power line of up to 800 k.v.a. capacity of similar construction as described in section 9.1.2.4 which is an extension of the power supply line up to the compressor house sub-station.

9.1.10.2 Power termination at the vent shaft sub-station is identical to that of the compressor house sub-station as described in section 9.1.3 with the exception that the capacity of the distribution transformer is 800 k.v.a.

9.2 Compressed Air Supply and Distribution

Compressed air for the Mine is to be provided from a permanent installation established near the decline box cut. Capacity is to be increased in stages as demand increases. Total demand is estimated as 4,500 c.f.m.

(i)	Building:	Location of the Compressor House is shown in Figure 2. Design is shown in Figure 2a. The building will be extended to the east as additional capacity is installed.
(ii)	Compressor:	Atlas Copco ER7E 1448 c.f.m. @ 100 p.s.i. 300 h.p. direct drive motor. Two subsequent units will be required as mine reaches full production.
(iii)	Ancillaries:	The Compressor unit is to be fitted with automatic controls and is supplied with after cooler and air receiver.
(iv)	Distribution:	The main permanent distribution line underground will be via an 8 inch diameter line down the decline. The first 130m. to the Portal will be of heavy galvanised iron pipe with the remaining underground pipe of polyethalene material. 6" diameter branch lines will be installed along strike drives.

9.3 Water Supply and Mine Drainage

(i) Water Supply - Surface

Water supply to the Bold Head Mine will be via 3" diameter polyethalene line from the Batching Plant (near the southern entrance to the New Complex area) to a 10,000 gallon tank adjacent to the Compressor House (Figure 2). The line is to be equipped with pressure relief valves and automatic level controls which will activate the 20 g.p.m. Kelly and Lewis pump, to be situated at the Batching Plant tank. Ancillary or alternative water supplies will be obtained from the re-circulation of desludged mine drainage water, if this proves sufficiently adequate in quality to warrant its use.

(ii) Water Supply - Underground

Two 4 inch diameter lines (a) from the 10,000 gallon tank

and (b) from the mine storage dam

will be joined on the 96m. level bench near the portal from which the line will be extended underground.

(iii) Mine Drainage

Final mine drainage requirements will depend on:-

(a) As yet undetermined extent of hydraulic filling in stoping.

(b) The extent of water inflow from country rock and water bearing strata within the Mine Series.

Pending further information on these factors an interim system has been designed incorporating:-

(a) Submersible air driven diaphragm pumps for decline face drainage - feeding to:

(b) Mobile tank mounted vertical spindle sump pumps feeding to:

(c) Permanent stations - initially direct decline Portal station and then as the face advances via intermediate stations down the decline.

Mine water will be pumped from the portal station to the settling dam from whence desludged overflow will be pumped into the mill tailings dam catchment, or re-circulated underground if required. The flow sheet for fresh make up water and mine drainage is shown in Figure 8.

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9.4 Road Access

A main haul road has been constructed to the mine site which will be used for ore haulage to the Mill. A subsidiary road has been constructed from the mine site to the change house and mine office. This will allow the movement of service and personnel transport. A further road will be built out from the compressor house area to Grahams Road and beyond to give eventual service to the ventilation shaft and main fan house.

9.5 Effluent Control

All mine water will be pumped to the settling dam. This will overflow into a clean water dam. Water from this dam will then be returned to the mine for drilling water, or overflowed into a pump sump. This pump will also take dirty water from the service bay area. All this effluent will then be pumped to a point at the top of the new tailing dam water shed, and will run into the tailing dam. This will protect the town water supply as Bold Head mine site is on the water shed of the Grassy River.

9.6 Sanitation

Surface toilet facilities are installed and underground portable toilets will be introduced as required.

9.7 Explosive Distribution

Initially explosives will be taken to the mine site as required from the existing magazines in the explosive truck. Later an underground holding magazine will be created.

10. SURFACE FACILITIES

Surface facilities for the Bold Head Mine are to be established as follows:

(i) Mine Vehicle Service Bay
(ii) Crib Room and First Aid
(iii) Site Toilet

(The above in proximity to the Box Cut as shown on Figure 1.)

(iv) Change House
(v) Mine Office
(vi) Lamp Room
(vii) Foremen's Small Tool Store
(viii) Rescue Station.

This latter group within the New Industrial Complex Area - adjacent to the new core shed building and making use of that building as shown in Figure 10.

This group is to be established as temporary units only - permanent facilities on a larger scale being required within two years of start-up to cover increased labour requirements.

10.1 Mine Vehicle Service Bay

This facility is required for routine servicing of heavy underground vehicles. Major repairs and maintenance will be carried out in the Company's heavy vehicle workshop. The site bay will include fueling and washing facilities. Layout is shown in Figure 3.

10.2 Crib Room and First Aid Station

This is a temporary facility pending the establishment of underground crib rooms and administrative/change house facilities at the Complex Site. The unit is to be equipped with hot and cold water, sink, etc.

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10.3 Site Toilets

A unit equipped with septic tank of design approved for daily labour complement of 20 men has been established in proximity to the compressor house.

10.4 Change House

Layout of the temporary change house to be established is shown in Figures 9 & 10 along with an attached specifications list. The building is to accommodate a maximum of 30 men over the two year period for which its use is intended. The building is to be connected to the New Complex Sewer System, with fresh water from the 10,000 gallon water tank store.

10.5 Administrative Buildings

These include a 40' x 10' mine office and sub-division of the core shed as shown in Figure 10.

10.6 Drill and Steel Sharpening Shops

Central shops for servicing all rock drills and for steel sharpening are being erected in the existing industrial area. This will service both underground mines and the open cut.

11. ORGANISATION AND TRAINING OF PERSONNEL

Initial manpower requirements for the Bold Head Project will be limited to a 3-shift decline development crew of four men with appropriate service/maintenance personnel seconded from the present maintenance establishment. Additional underground labour will be recruited from the present overall company labour force and from outside as development progresses. At full production a maximum underground labour force of not more than 80 is envisaged.

11.1 Staffing

The Mining Superintendent will be directly responsible for project operations and apart from the normal support functions of Planning, Survey, Geological and Engineering Services, etc., initial staffing will consist of:-

(a) One Senior Underground Foreman
(b) Three Shift Foremen.

As complexity of the operation and manpower increases additional staffing will be required to handle direct underground service functions. The Mining Department organisational chart is shown.

11.2 Training of Personnel

Whilst some key functions are to be filled by outside recruitment of skilled personnel maximum possible utilisation of available mine labour is to be made. This is to avoid redundancy of personnel as the open cut operation is scaled down. The Company is to hold a two week induction course immediately prior to the start of decline development, during which it is intended to give practical training on all equipment to be used underground. Lectures on safety, first aid and underground regulations will be given by Company personnel experienced in underground work. It is also intended to hold regular refresher training courses along with normal on-the-job training.