

7th August, 1968.

ABERFOYLE TIN N. L.

TO - The Manager.
FROM - Mines Superintendent.
SUBJECT - OCCURRENCE OF WATER - 13 LEVEL.

The chronological sequence of events pertaining to new occurrence of water tapped by Underground drill hole in the 13 Level Lutwyche Drive is as follows -

Tuesday, 18th July, 1967. - Struck water in D.D. hole at a distance of 134 ft. from collar on afternoon shift. The water was intersected at a point 30 ft ahead of the face.

The drill was collared in a cuddy on the east side of the drive and 1632½ ft from datum.

Work at the face of the Main Drive was stopped immediately.

14 level shaft sump was overflowing 3"-4" over the plat.

Wednesday, 19th July, 1967 - Measured flow from D.D. Hole -

120 g.p.m. Total flow from 13 level - 300 - 350 g.p.m.

Pumping from 14 level est. - 450 g.p.m.

Water from surface drill holes, S17 and S19 - just bubbling from the collars.

Friday, 21st July - Inspection of surface drill holes - water only trickling from same.

Attempted to clean out slime from 14 level pump sump - blocked foot valves of No.1 pump - conditions 14 level serious as regards water from mid morning until mid afternoon - water rose 1½ ft above sump 14 level before No.1 pump could be restored by shortening foot valve.

Saturday, 22nd July - Regained control of water on 14 level sump.

No.2 pump working continuously, No.1 pump cycle 62 mins on and 13 mins. off.

Pomona pump in shaft sump turned off as unable to cope with water on level - overflow from shaft area draining into pump sump.

Removed quantity of slime from 14 level sump. 24 hourly watch on pumps over weekend required.

Afternoon and night shift (Sun) skeleton crew came on for 15 hours attempted to close water door 13 level after removing gear from drive - unsuccessful as modifications were required for proper door operation.

Sunday, 23rd July - Skeleton crew on for 15 hours to watch pumps and continue efforts to close door in case of emergency.

Monday, 24th July - 6" pipe, with valve, connected into drain under 13 level water door. Concrete block installed (6 ft long) on downstream side of door.

Tuesday 25th July - Fitted 6 ft of casing and 1" valve into drill hole to control water, however, too much water was found to squirt into drive through broken ground 15'-20' from collar when under pressure with the valve closed. Pressure reading under these conditions 210 p.s.i.

It was decided necessary to case hole completely if control of water to be had. 100 ft of XRT casing ordered after attempts to case the hole with 1" G.I. pipe were unsuccessful.

Wednesday, 26th July - Water stopped flowing from surface drill holes, S17 and S19, height of water level with collars. It was decided to cut a new sump on 13 level and install another pump at this position to handle all water from 13 level direct to 10 level sump. Also to connect water from drill hole into existing 4" air main along 13 level drive, connect this to a new 4" column up shaft direct to 10 level. Also to recondition old 6 and 8 level pumps and sumps to reduce quantity of water \times gravitating to 10 and 14 level pumps. XRT casing and shoe bits arrived air freight from Melbourne for casing hole.

Thursday, 27th July - Drill hole cased to 120 ft and a 1" valve installed. Pressure reading from hole 340 p.s.i. (giving a pressure head of 786 ft), considerable leakage from hole preventing a total reading to be obtained. Because of high pressure reading normal valve inadequate and a high pressure valve required. Commenced stripping of 13 level sump.

Friday, 28th July - Continued stripping of 13 level sump and installed forming for concrete reinforcing on up stream side of door.

Saturday 29th July - Continued stripping of 13 level sump and commenced installing 2 x 4" water columns from 13 level to 10 level, and placing of concrete reinforcing on both sides of the up stream side of the door.

Cleaning out of 6 level sump so that 6 level pump could be put back into operation. Water in surface drill holes measured to 2'4" below collars of S17 and S19.

Sump timbering almost finished - drain
Pressure reading on 13 level drill hole after 1½" high pressure valve installed 360 p.s.i. (total pressure head 833 ft). Casing rock bolted to face ~~xx~~ of cuddy and timber sprogged. Total flow measured from 13 level 300 g.p.m.

Sunday 30th July - Continued working on 13 level sump, 4" water columns in shaft and reinforcing concrete.

Monday 31st July - Water in surface drill holes measured at 4'6" below collar of S17 and S19. Pressure reading on 13 level drill hole, immediately 340 p.s.i. rising to 360 p.s.i. after 10 minutes.

Tuesday 1st August - 6 level pump operating. Water flow measured and to be in opera from drill hole 85 g.p.m. Pressure reading

Wednesday 2nd August - 360 p.s.i. rising to 365 p.s.i. after 15 mins.

8 level pump discharge connected into 6" line from 10 level, but pump choked out when 10 level pump operating. Arrangements being made to couple a direct column from 8 level to 4 level via 6 level column bypassing 6 level pump. Water level in surface drill ~~xx~~ holes measured 6'9" below collar.

Thursday 3rd August. - Drill hole 13 level connected to existing 4" air column along drive. This in turn connected to 4" water column up shaft direct into 10 level sump. Flow from 13 level measured at 83 g.p.m. into sump on 10 level.

Friday 4th August - Forming constructed around both sides at top of water door on 13 level for further reinforcing. Pomona pump on 14 level switched on again and shaft sump drained. 14 level pumps reduced to 1 pump operation only (No.1 pump). Water from 13 level reduced to approximately 200 g.p.m. from drive.

Saturday 5th August - Cleaned out 13 level sump and commenced forming for concrete wall on east side. Attempts to place concrete around top of water door not very successful.

Sunday, 6th August - Placed concrete around top of water door, using modified air lift and for sump wall. Commenced timbering in sump area ready for pump to be installed.

Monday, 7th August - Sump timbering almost finished - drain connections to be made and 4" water column to be installed along 13 level to shaft. Pressure reading at 13 level D.D. hole 360 p.s.i. rising to 370 p.s.i. after 20 minutes. Water in surface drill holes measured at 8'6" below collars.

Work still to be done -

Finish construction of drains and water column and clean up at 13 ~~xxxxxx~~ level sump. Power cable to be installed to 13 level. Plan operation regarding site for new drill hole on 13 level to intersect water in vicinity of known water bearing area. Use of 8 level pump to relieve pressure on 10 level pumps. (This is expected to be in operation tomorrow 8th August, 1967).

Tuesday, 8th August 1967 - Measured flow from D.D. Hole - 120 g.p.m. Total flow from 13 level = 300 - 350 g.p.m. Pressure at 13 level = 400 p.s.i. Water level in shaft = 117 ft - just bubbling from the collars.

A. J. Murphy
Mines Superintendent.

Friday, 21st July - Inspection of surface water trickling from sump. Attempted to clean out sump from 14 level pump sump - blocked float valves of No. 1 pump - conditions 14 level serious as regards water from mid morning until mid afternoon - water rose 1 1/2 ft above sump 14 level before No. 1 pump could be restarted by short-circuiting float valve.

Saturday, 22nd July - Regained control of water on 14 level sump. Pump working continuously, No. 1 pump cycle 42 mins on and 13 mins off. Shaft sump turned off as unable to cope with water on 14 level - overflow from shaft sump into 13 level sump. Quality of water from 14 level sump - fairly water.

Overnight shift - 13 level sump working for 13 hours. 14 level sump still overflowing into 13 level sump. 13 level sump working for 13 hours.

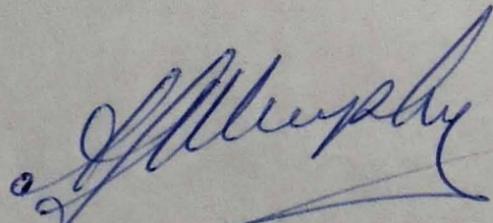
31st March, 1969.

ABERFOYLE LIMITED

TO - Drilling Foreman (Copies to Lutwyche Project Eng.,
Underground Manager, Senior Mining
Foreman, Senior Geologist).
FROM - Mines Superintendent.
SUBJECT - DIAMOND DRILLING - 13 LEVEL LUTWYCHE.

Due to the increasing volume of water being intersected in drill holes from the 13 level drives and the associated danger of intersecting water at such high pressures (370-400 p.s.i.), it appears essential that 2 man crews are required for all drilling carried out in this area.

Will you please arrange for 2 man crews to work together on all future holes drilled off the 13 level Lutwyche drives or crosscuts.


A. J. Murphy
Mines Superintendent.

ABERFOYLE LIMITED

TO - Chief Geologist (Copy to Manager, Senior Geologist,
Mines Superintendent).

FROM - Geologist.

SUBJECT - 13 LEVEL WATER PRESSURE MEASUREMENTS.

Listed below are water pressure readings taken on D.D. holes collared in the Hangingwall Drive, north end, Lutwyche Prospect, as supplied by A. Denham. These pressures were measured with the grout pump pressure gauge, after emplacement of grout stems in the hole collars.

<u>D,D.H.No.</u>	<u>lbs/sq.in. H₂O</u>
AU13-26	400
AU13-33	400
(Percussion Holes, Nth Dr. Face)	(150)
AU13-34	400
AU13-30	0
AU13-27	450
AU13-29	500
AU13-25	500

Maxel Rangott

M. Rangott
Geologist.



DEPARTMENT OF MINES

TELEPHONE: 30 9011

G.P.O. BOX 124 B
HOBART
TASMANIA 7001

COPY:

2nd May 1978

The Director of Mines,
HOBART

Water conditions at Lutwyche Workings, Rossarden

On 17 and 18 April, I visited Rossarden with Mr R. Thomas to discuss the water problems of the Lutwyche workings with Abminco. Our discussions both on the surface and underground were with their geologist Mr Ken Palmer and Mine Superintendent Mike Eager.

The mine rock consists of an apparently tightly folded Mathinna series of fairly cleaved muddy and sandy slates with still-apparent bedding. The bedding does not vary much from 330°, but may dip steeply either way. Sandy beds predominate, and the hydrolic properties depend mainly on bedding fractures and related joints.

The Lutwyche workings are approached on the 13 level. Their wet reputation is, in my opinion, ill deserved as water enters the main drive in only two areas and in no great volume.

Further evidence of the water problem is however to be seen at the end of the main drive where several diamond holes have been collared and provided with valves.

A static pressure of some 460 p.s.i. in the raise and 480 p.s.i. in the drive can be observed in the diamond holes, and this I take to confirm a continuous water table to near surface.

Diverting for a moment to surface, the Aberfoyle Creek flows sinuously across the bedding of the slates 1200 ft above the Lutwyche workings, and diamond holes close to the creek provide flow into it, showing that a hydraulic head exists above the creek, and that the creek is a gaining stream rather than a losing one. This observation is of a normal situation in Mathinna and similar aquifers at all seasons of the year. The deduction is therefore that the formation must supply water to the mine and that the creek, if anything, provides a minor amount of drainage.

The static pressure observed in the mine is due then to an unconfined water situation in the rock fractures, which only rarely reach as far down as the 13 level.

The behaviour of the flow from the drained holes in the raise in conjunction with the resulting pressure changes provides an illuminating insight into the hydrology of the mine rock.

A static pressure of over 400 p.s.i. drops to about 180 p.s.i. when a flow estimated at about 120 g.p.m. is released from the nearby bore holes. This shows that over a span of about 50 ft the fractures penetrated by the six holes provide sufficient hydraulic resistance to drop the static pressure to less than half. This not only indicates that the transmissivity of the rock fractures is very low, but it provides a solution to the problem of drilling further in the presence of high static pressures.

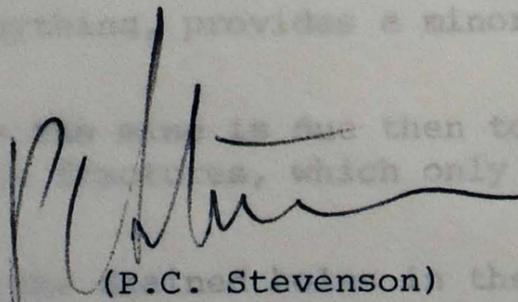
A low transmissivity must in these rocks also indicate a low storage coefficient. This has been estimated independently in groundwater work as in the region of .001 to .003, that is to say that from 1 to 3 parts in 1000 of the volume of the rock consists of useable storage. Low as this value is, when applied to the available volume in the rocks say within a mile of the workings, the volume of water represents 6×10^7 gallons. This volume while not large, could only be drained slowly because of the low transmissivity. A rough estimate gives a period of some decades. Control and not drainage is therefore the best policy.

In discussion, the suggestion arose, and it is no more than a suggestion, that the water encountered is contained in a structure discordant with the main lineation of the mine and possibly dipping at a shallow angle toward the north-east in the roof of the main drive. Some joint faces of similar orientation were seen. The possibility of this structure should be explored when further drilling is done.

On the question of encountering any great changes in the transmissivity of the formation in any development from 13 level, this does not seem likely, as great changes would require changes in lithology or structural style or both, and no such changes are known from drilling results or surface work. Local high flows could occur and require prudent mining methods but local high volumes do not seem possible.

As drilling proceeds, flow measurements from the holes should be made at one or two metre intervals under full head conditions so that a survey of hydraulic resistance in three dimensions may be compiled in areas where development is intended.

Water samples tested for conductivity in the mine showed low values (equivalent to 220 ppm Na Cl), a typical Mathinna water value. No additional salinity was apparent due to transmission through the formation. Samples for chemical analysis were taken but results are not yet available.



(P.C. Stevenson)
SUPERVISING GEOLOGIST
ENGINEERING GEOLOGIST