FILE NAME: Colonial Sugar Refinery (CSR)

DATE: 1960 July 22

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DOCUMENT DESCRIPTION: Letter to Senior Inspector of Mines, Kalgoorlie, with Govt Inspection Results from Wittenoom with Dust Count Tabulation Tables

1400.

KALGOORLIE.

The Senior Inspector of Mines,

Mines Department,

KALGOORLIE.

22nd July, 1960.

Ventilation - Australian Blue Asbestos Limited, Wittenoom.

Together with Workmen's Inspector Hunt, I carried out an inspection and airflow survey of the Colonial Mine and Treatment Plant from 22nd to 25th June, 1960.

Underground.

Conditions were satisfactory at all working places except most places where a machineman was employed. As can be seen from the recorded dust counts and temperatures, most places where a machineman was working resulted in above average dust counts, high humidity and a negligible airflow. The reason for these factors, as can be seen from the accompanying plan, is that the stope faces are gouged out forming pockets, where I consider it is impossible for the natural air current to satisfactorily ventilate. All scrapers are installed at the manways thus receiving the full benefit of the air current which flows from the levels via the manways, and chutes if empty, into the stopes and thence through the stopes to the exhaust fan. Air water sprays are installed at all passes in the stopes. The northern workings are by far the most poorly ventilated This is because they are outside the influence of the exhaust fan. It was suggested to the management that workings outside the natural ventilation circuit should be equipped with secondary ventilating appliances, but this suggestion did not meet with a very warm approval.

When looking from the bottom to the surface of the main adit a noticeable amount of dust appeared to be present in the air throughout. As the conveyor system operates in the main adit and th transfer points are fitted with air-water sprays, some of the apparent dust may actually be fog created by the sprays. Only one dust count was taken in the main adit, this being adjacent to the No 6 level Ross Feeder where welders were working in the mouth of the chute. A count of 670 p.p.c.c. was obtained, but it is doubtful if this concentration would be throughout the main adit. As one third of the total air is drawn down the main adit the intake air is polluted by dust, to a certain degree, before it enters the mine workings.

At the grizzly on each level much dust was caused through the tipping of ore and would then join the main airflow on each level and pass through the respective mine workings. No sprays were evident at the various grizzlies although I cannot say for certain whether or not sprays were installed at these points.

Air Measurements.

Ventilation of this mine is still carried on by a Richardson 60 A.F. Class A Axial Flow Fan running at 700 r.p.m. with a 20 H.P. electric motor driving it. The management informed me that this fan was to be speeded up during the week-end following my visit.

Unfortunately the new speed was not discussed, therefore

Three main intake areas are at present drawing air viz. Main Adit, No 3 Cliff Opening and No 4 Cliff Opening. Except the Exhaust Fan Opening and the above intakes all other openings to the cliff face are bratticed off. Doors are installed at the Nos. 1 & 2 Cliff Openings and both are fitted with locks thereby ensuring they are kept shut.

All major air velocities were measured with the Wilh Lambrecht Flow Meter. The lesser velocities being measured with the Flame Anemometer. Unfortunately the readings obtained with the Flow Meter were found to be well below the true velocities. Upon arrival back at Kalgoorlie a check was made between the Flow Meter and a Pilot Tube at the Lake View and Star Mine. Graphs were drawn showing Flow Meter velocities and true velocities. From these graphs all velocities recorded at Wittenoom have been adjusted, therefore the volumes shown should be correct.

The recorded volumes at the main points were as follows:-

Main Adit	Intake	23,000	cumins.
No 3 level Cliff Opening	"	24,000	"
No 4 " " "	"	22,500	"
Leakage thro No 2 " "	"	1,000	"
	Total	70,500	"
Main Exhaust Fan		65,500	"

This exhaust reading of 65,500 cfm would be very questionable because the reading was taken at the cliff face at the discharge side of the fan. The position occupied for reading was very unsatisfactory as a steady flow was not issuing over the whole area. Instead, a turbulent flow was issuing from the fan which would cause an erroneous result. The intake quantities gave steady flows and were checked up to three times and each time gave similar readings, therefore I would say the total quantity of air circulating through the mine would be approximately 70,000 cfm. Previous years have shown greater quantities than this, but it must be remembered the mine is increasing in size, therefore longer distances to draw the air resulting in higher pressures for the fan to work against.

Although the quantities shown remained constant throughout the period of the survey, it was noticed that when the wind changed to an easterly, i.e. blowing directly into the main adit, the volume of air entering the adit increased considerably. On the morning of Saturday 25th June, the volume of air entering the main adit, whilst an easterly wind was blowing, was measured at 35,500 cumins. This represents half the normal quantity of air passing through the mine and as the exhaust fan would be working against the wind its output must be decreased to some degree. Apparently the wind blows from this quarter quite a lot at various times of the year, therefore a short vertical evase attached to the fan would be a definite advantage in overcoming the increased pressure caused by the wind.

Volumes measured in the Nos 1 and 2 level Turnouts were 7,000 and 5,000 cumins respectively. As all work is now advanced below No 3 level, the above quantity totalling 12,000 cumins is just going to waste, i.e. passing directly to the exhaust fan. Only four stopes are now being worked above No 3 level, yet some 17,000 cumins are being expended from the No 3 level intake and some 5,000 cumins from the main adit intake to ventilate these four stopes.

From the tabulation of dust counts, it will be seen that one of these stopes viz. No 3 level 9014 stope has a negligible through air flow and the other, 9017 stope is ventilated by a 24" electric fan from the manway. From this it can be seen that a

Nos 1 and 2 levels gives a total of 27,000 cumins serving no useful purpose. This represents approximately two-fifths (2/5) of the total airflow, i.e. approximately 33,000 cumins passing into actual operating stopes, which is rather poor for a mine of such large open areas.

I consider the greatest danger with the large openings and lack of airflow through most of the working places is the possibilit of miners being fumed. Especially when the machineman fires knock-off day shift and the scraper driver has to enter the fired area in order to rig his blocks and bog back, etc., first thing on afternoon shift.

Treatment Plant.

Since my last visit (November 1956) the old Wittenoom mill has ceased operations and a new mill has been erected at Colonial Mine. The new mill appears equal to, if not better than any other operating plant in this State. Every section of the plant is being kept in spotless condition. If any dust or fibre leaks are seen, that particular section is closed down until repairs are effected. All ducting associated with dust extraction is painted grey and all that associated with fibre extraction, yellow. From the tabulation of dust counts it can be seen that most counts are above average for which no explanation can be forwarded. Visually, the atmosphere inside the plant appeared extremely free of dust. Very little fibre was observed in the samples whilst counting, but this would be no criterion as the Watson Konimeter is highly unsuitable for measuring asbestos concentrations. Men employed at the Bagging Stations wear dust masks at all times whilst bagging.

The dust, upon being extracted from the ore is passed through three Rotoclones situated outside the building. The Rotoclones are definitely doing a marvellous job in dust extraction, but unfortunately the finer particles are not being collected. Consequently a steady stream of smoke-like dust is being passed into atmosphere above the plant, via the stacks attached to the Rotoclone: Although this dust has little or no effect upon surface operations, it tends to be a source of annoyance as far as underground is concerned. This is because when an easterly wind is blowing the dust is carried into the intake openings of Nos 3 and 4 level Cliff Openings. The dust would be expected to have dispersed sufficiently before entering the mine working, but unfortunately this is not the case.

RECOMMENDATIONS.

1. Doors be erected in Nos 1 and 2 level Turnouts in order to prevent loss of 12,000 cumins. The installation of these doors was also recommended by District Inspector Foichney in his report dated 9th June, 1958.

2. A regulator door be erected at No 3 level Cliff Opening in order to reduce the quantity of air entering this level.

OR

All manways on the No 3 level, south of the manway at co-ord. 550N be fitted with regulator trap doors together with the erection of a regulator door south of co-ord. 550N manway. These would allow a full flow of air into No 3 level at the Cliff Opening and only a desired amount through the various regulators, the rest would downcast to the Main Adit and join the Main Adit downcast air.

3. If the regulator door be erected at No 3 level Cliff Opening, the No 4 level South of the No 3 Adit would need to be stripped out in order to take the increased airflow, also to lower the resistance. More air could be passed through the No 4 level regulator door if desired.

5. Better planning and control of stoping in order to eliminate as far as practicable, the dead pockets, which at present are far too prevalent,

6. Secondary ventilating appliances be supplied to all machi parties and used to their best advantage once working faces extend beyond the through air current.

7. A sound mining method of overcoming 5 and 6 would be to stope the ore by using the Retreat Method of Mining. That is open up and mine out the northern block first, brattice off this section then commence mining the block south of the mined out portion and so on until that level is completely mined out. This method would allow the full volume of air to pass through the working areas.

8. At present when a rake of trucks is not being used, the rake is left just north of the turnouts. On the No 5 level the quantity before and after a rake of trucks was left in the level, north of the turnout was 12,000 and 4,000 cumins respectively. From this it is evident more thought into the positioning of idle trucks is required.

9. Sprays to be installed at all level ore passes if not already installed.

10. Regarding the dust exhausting from the Rotoclones. I do not think the installation of another Rotoclone will reduce the dust exhausting to any appreciable degree. I consider a cheaper and more effective means of depositing the dust would be as follows:-

Cut a chamber on large tunnel into the side of the gorge, instal banks of air-water blasts and exhaust the airflow from the Rotoclones into the far end of this chamber. The sudden drop in velocity would cause a deposition of dust, and the bulk of not deposited ~~the bulk~~ would collect on the mist formed by the sprays. The exhaust air from the chamber could then issue slowly into the atmosphere.

Instead of cutting a chamber, portion of the old workings could be sealed off and serve the same purpose.

General.

During the process of counting the dust particles, particular attention was paid to the amount of asbestos fibre present in each sample. In both the underground and mill samples only an odd strand of fibre was observed.

Regarding the apparent dust concentration in the main adit short of upcasting it there appears nothing can be done. Upcasting the main adit seems highly impracticable at present.

In order to illustrate the dead pockets referred to in this report, I have numbered most of them on the accompanying plan, the same number has been placed on the attached tabulation of dust counts for the corresponding working place. The numbers have been drawn with blue ink for easy recognition.

Attached is a tabulation of dust counts and temperatures recorded at the Colonial Mine and Surface Plant on 22nd and 23rd June, 1960.

State Mining Engineer,
PERTH.

ASSISTANT INSPECTOR OF MINES.

TABULATION OF DUST COUNTS

DATE	MINE	PLACE	COUNT	TEMPERATURE DRY	TEMPERATURE WET	REMARKS
AUSTRALIAN BLUE ASBESTOS.						
23-6-60	Surface Plant	Mine transfer Bin	160			Ventilated by 12" E.F.
	Colonial	Picking Station	330			6 men employed.
		Primary Crusher	470			
		Secondary Crusher Switch board	150			
		Screens Floor	210			
		Cyclones Switchboard	540			
		Screens after Cyclones	390			
		Bagging Station (North)	150			Not working at full capacity.
		Bagging Station (South)	300			
		Warm sunny day with a fair North-easterly breeze.				

ASSISTANT INSPECTOR OF MINES.

TABULATION OF DUST COUNTS

DATE	MINE	PLACE	COUNT	TEMPERATURE DRY	TEMPERATURE WET	REMARKS
AUSTRALIAN BLUE ASBESTOS.						
22-6-60	Colonial	No.3 level 9020 L.S. Stope	80	76.5	68	Scraping - Thro air.
		No.3 " 9050 L.S. Stope	50	78	69.5	Scraper temp idle - Thro air.
	1.	No.3 " 9014 "	110	80.5	76	Boring - Thro air (negligible
		No.3 " 9017 "	20	85	73	Boring - Thro air 4000 cfm. induced by 24" E.F.
		No.3 " 9017 "	70	83.5	75	Scraping - Thro air.
		No.4 " 4000 L.S. Stope	150	75	67.5	Temp idle - Thro air.
		No.4 " 1N "	140	77	66.5	Scraping - Thro air.
	2.	No.4 " 1N "	110	81	78	Hand bogging - Vent to be inst
	3.	No.4 " 2N "	250	80	78	Boring - Negligible airflow.
		No.4 " 1S "	430	76	64.5	Boring - Thro air.
		No.4 " 1S "	440	78/5	77	Boring - Negligible airflow.
	4.	No.5 " 2S "	210	77.5	74	Boring - Negligible airflow.
		No.5 " 2S "	320	77.5	70	Scraping - Thro air.
		No.6 " Main adit Ross Vocdor	670	80	75	Welders - Thro air up chute.
		No.6 " Charging Station.	290	76	69.5	Moch Bog - Sat - 12" EF from 2
		No.6 " " "	240	76	69.5	Boring - Sat - 12" EF from 4(
		No.6 " 3S Rise.	100	77	65	Charging - Adj thro air 4000. (Rise 5 feet up)
		No.6 " 2S Rise.	160	79.5	74	Boring 15' from duct.To be co 12" EF from 2500 cfm.(Rise 3(
	5.	No.6 " 00 Stope	270	82	75	Boring - Sat - 16" EF split 1 2500 cfm.
		No.6 " 1N level.	350	81.5	72.5	Moch bog temp idle. Sat. 16" from 1500 cfm.
23-6-60		No.5 " 3S Stope	100	75.5	66.5	Scraping - Thro air.
	6.	No.5 " " "	220	75.5	73	Charging - Negligible airflo:
	7.	No.5 " 1S "	140	77	70.5	Charging - Thro air induced 1

TABULATION OF DUST COUNTS

DATE	MINE	PLACE	COUNT	TEMPERATURE DRY	TEMPERATURE WET	REMARKS
AUSTRALIAN BLUE ASBESTOS						
3-6-60	Colonial	No 5 Level 1st Stope	250	78.5	73.5	Scraping - Thro air.
" 8.		No 5 " 00 "	110	79.5	76	Charging - Thro air (Adjacent)
		No 5 " 00 "		78	71.5	Temp idle - Thro air.
		No 5 " 2N "	210	79	68	Scraping - Thro air.
" 9.		No 5 " 2N "	600	80.5	77	Boring - Negligible airflow.
		No 5 " 1N "	170	78.5	68.5	Scraping - Thro air.
" 10.		No 5 " 1E & N stope	360	79.5	76	Charging - Negligible thro air
" 11.		No 5 " 1W & N "	370	81.5	79	Charging - Negligible thro air

ASSISTANT INSPECTOR OF MINES.

AIR MEASUREMENTS - A.B.A. LTD. 24 & 25th JUNE, 1960.

MEMO FOR VENTILATION OFFICER.

The follwoing volumes were derived after calibrating our flow meter and correcting the recorded velocities.

Main Adit Intake	23,000 cumins
No 1 Level.	
No 1 Turnout —— level	7,000 "
—— Sth of Turnout	3,500 "
—— Nth " "	3,800 "
—— Nth of 2020	2,000 "
—— " " 2050	500 "
No 2 Level.	
No 2 Turnout —— level	5,000 "
—— Nth of 6020	2,000 "
—— " " 6050	500 "
—— Sth of Turnout	Nil
From Cliff Opening —— up 6010	1,000 "
No 3 Level.	
Cliff Opening Intake	24,000 "
—— Nth of 9040	17,000 "
—— " " 9010	12,000 "
—— " " Manway to Main Adit	5,000 "
i. e. Manway to Main Adit is downcast	7,000 "
No 3 Turnout —— Level	5,000 "
—— Nth of 9020	7,000 "
—— " " 9050	5,000 "
—— " " 9080	3,000 "
—— " " Manway co-ord 1050 N	2,000 "
—— " " Manway co-ord 1300 N	1,000 "
No 4 Level.	
Cliff Opening Intake	22,500 "
No 3 Adit Intake	19,000 "
—— Nth thro' regulator door	3,500 "
—— Nth of 42 S	2,000 "
—— " " 41 S	1,000 "
—— " " 40 S	3,000 "
i.e. Upcast from Main Adit.	2,000 "
No 4 Turnout —— Level	6,000 "
—— Nth of 41 N	6,000 "
—— " " 42 N	4,000 "
—— " " 43 N	2,000 "
No 5Level.	
—— Sth of No 3 Adit	3,000 "
—— West down No 3 Adit	7,000 "

———	Nth of 50 S	5, 500	cumins
i.e. Upcast from Main Adit		2,500	"
No 5 Turnout———	Level	6,500	"
i.e. Main Adit—	West supplies	5,000	"
& " " —	East "	1,500	"
		from No 6 Level.	
Therefore total-	Nth of Turnout	12,000	"
———	" " 51 N	8,000	"
———	" " 52 N	4,000	"
No 6 Level.			
Upcast into 65 S		3,000	"
———	Nth of 65 S into Fan and thence Main Adit.	4,000	"
Main Fan Exhaust		65,500	"
TOTAL INTAKE.		70,500	"

Because of the intermittent flow from the exhaust fan thereby giving a doubtful result, the total intake volume has been taken as correct. The total quantity of air flowing through the mine has therefore been taken as approximately 70,000 cumins.

Quantities measured before and after a rake of trucks was left north of No 5 level Turnout, were 12,000 and 4,000 cumins respectively.

Sgd ? SIMMONDS

ASSISTANT INSPECTOR OF MINES.

ate	Mine	Place	Count	Temperature Dry	Temperature Wet	Remarks
LIAN BLUE ASBESTOS						
.60	Colonial	No 3 level 9020 L.S. stope	80	76.5	68	Scraping - Thro air.
		No 3 level 9050 L.S. "	50	78	69.5	Scraper temp idle - Thro air.
		No 3 " 9014 "	110	80.5	76	Boring - Thro air (negligible flow)
		No 3 " 9014 "	20	85	73	Boring - Thro air 4000 cfm. induced by 24" E.F.
		No 3 " 9017 "	70	83.5	75	Scraping - Thro air.
		No 4 " 4000 L.S. "	150	75	67.5	Temp idle - Thro air.
		No 4N " 1N "	140	77	66.5	Scraping - Thro air.
		No 4N " 1N "	110	81	78	Hand Bogging - Vent to be installed.
		No 4 " 2N "	250	80	78	Boring - Negligible airflow.
		No 4 " 1S "	430	76	64.5	Boring - Thro air.
		No 4 " 1S "	440	78.5	77	Boring - Negligible airflow.
		No 5 " 2S "	210	77.5	74	Boring - Negligible airflow.
		No 5 " 2S "	320	77.5	70	Scraping - Thro air.
		No 6 " Main Adit Moss Feeder	670	80	75	Welders - Thro air up chute.
		No 6 " Charging Station	290	76	69.5	Mech. Bog. - Sat- 12" EF from 2500 cfm.
		No 6 " " "	240	76	69.5.	Boring - Sat - 12" EF from 4000 cfm.
		No 6 " 3S Rise	100	77	65	Charging - Adj thro air 4000 cfm. (Rise 5 feet up)
		No 6 " 2S Rise	160	79.5	74	Boring 15' from duct, To be extended 12 EF from 2500 cfm. (Rise 30' up.)
		No 6 " 00 Stope	270	82	75	Boring - Sat - 16 " EF split from 2500 cfm
		No 6 " 1N level	350	81.5	72.5	Mech Bog. temp. idle. Sat. 16" EF split fr
.6.60		No 5 " 3S Stope	100	75.5.	66.5	Scraping - Thro air.
		No 5 " " "	220	75.5	73	Charging - Negligible airflow.
		No 5 " 1S "	140	77	70.5	Charging - Thro air induced by 12" EF.
		No 5 " 1S "	250	78.5	73.5	Scraping - Thro air.
		No 5 " 00 "	110	79.5	75	Charging - Thro air (Adjacent)
		No 5 " 00 "		78	71.5	Temp idle - Thro air.
		No 5 " 2N "	210	79	68	Scraping - Thro air.
		No 5 " 2N "	600	80.5	77	Boring - Negligible airflow.
		No 5 " 1N "	170	78.5	68.5	Scraping - Thro air.
		No 5 " 1S & H Stope	360	79.6	76	Charging - Thro air (Negligible)
		No 5 " 1N & H "	370	81.5	79	Charging Negligible Thro air.

Sgd. ? SIMMONDS.
DISTRICT INSPECTOR OF MINES.

Date	Mine	Place	Count	Temperature Dry	Temperature Wet	Remarks
STRALIAN BLUE ASBESTOS LIMITED.						
3.6.60	Surface Plant	Mine Transformer Stn	160			Ventilated by 12" E.F.
	Colonial	Picking Station	330			6 Men employed.
		Primary Crusher	470			
		Secondary Crusher-Switch Board	250			
		Screen Floor	210			
		Cyclones Switchboard	540			
		Screens after Cyclones	390			
		Bagging Station (North)	150			Not working at full capacity.
		Bagging Station (South)	300			

Warm sunny day with a fair North-Easterly breeze.

Sgd. T SIMMONDS,

DISTRICT INSPECTOR OF MINES.